Culture, Institutions and Economic Performance

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Abstract

The role of cultural diversity in various aspects of society has been theoretically and empirically investigated. Prevailing measures of cultural diversity mainly focus on diversity of ethnicity, religion and language. However, there has been little discussion about diversity in human values. We construct cultural diversity measures based on human values and seek to examine its role in economic development. This thesis demonstrates the significance our measure plays in estimating the impact of formal institutions (rule of law) and informal institutions (respect for others) on economic performance.

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AUTHOR'S DECLARATION

I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.
Further, Chapter 3 is drawn from collaborative work with my supervisors, Dr Alexander Kovalenkov and Dr Arjunan Subramanian.

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Chapter One: Introduction

1.1 Background and Motivation

In recent years, there has been increasing interest in the role of cultural diversity in many aspects of society. The impact of cultural diversity has been investigated from the viewpoint of economic growth (Easterly and Levine, 1997 and Alesina and La Ferrara, 2005), trust (Zak and Knack, 2001), government performance (Alesina et al. 2003 and La porta et al., 1999), social stability (Nettle et al., 2007), democratization (Akdede, 2010), and many other perspectives. The role of cultural diversity has been researched from language, ethnic, and religious affiliations. However, there are some drawbacks in these indices. Many researchers point out problems caused by lack of a uniform criterion to define these affiliations. This is because group identities are complex. To make matters worse, as globalization advances, it becomes difficult for some people to clarify their own ethnicity, religion or language. A person who brought up with more than one language finds it difficult to identify her native language. Further, widely used cultural diversity measure assumes that sum of the population shares of the cultural groups in a society is 100 percent. However, when it comes to religion, the CIA World Fact Book shows that 83.9 percent of Japanese are classified as Shintoism, 71.4 percent as Buddhism, 2 percent as Christianity, and 7.8 percent

as others. It is apparent that the sum exceeds 100 percent. Therefore, this thesis aims to address these problems and construct a new cultural diversity measure based on human values.

The role of cultural diversity has been discussed by many researchers from the aspect of “external traits” such as ethnicity, religion and language. Contrary to previous studies, we aim to investigate the role of diversity in “internal traits” such as human values. There has been little discussion on the role of diversity in “internal traits” so that this study proposes a new aspect of cultural diversity. We call this measure “value diversity”. Commonly used measures are created using ethnic, religious, or language groups. People speaking English are grouped in one group. This thesis follows this way and makes groups that share similar values. In contrast to ethnicity, language, and religion there are no pre-determined groupings for human values. Therefore, in order to group individuals, we create “value type”. Individuals who made similar responses in survey questions are classified into the same value type. Simple way to group individuals is to select one dichotomous question from the World Values Survey (WVS)[1] and classify individuals into two value types. However, this way captures only one aspect of human values so that we introduce existing frameworks of cultural dimensions. Cross-cultural research identifies sets of cultural values useful in describing cultures. This study introduces two well-known value theories- Inglehart value theory (dimensions) and Schwartz value theory (dimensions)[2].

Firstly, we consider Inglehart’s approach to human values. In Inglehart (1997) and Inglehart and Welzel (2005), two major dimensions of cross-cultural variation are shown. First dimension is traditional versus secular-rational values. Traditional values emphasize the followings. (1) God is important in respondent’s life, (2)

[1] WVS provides a cross-cultural measure of peoples’ values

[2] There are many other studies that investigate cultural dimensions. For instance, Hofstede (2001) has developed so-called Hofstede’s dimensions; Individualism vs collectivism; uncertainty avoidance; power distance and masculinity vs femininity.

importance of obedience and religious faith, (3) abortion is never justifiable, (4) national pride and (5) respect for authority. Secular-rational values have the opposite preferences on all of these topics. Second dimension is survival versus self-expression values. Survival values emphasize the followings. (6) Economic and physical security, (7) not very happy, (8) against a petition, (9) homosexuality is never justifiable and (10) careful about trusting people. Self-expression values have the opposite preferences on all of these topics. These two dimensions explain more than 70 percent of the cross-national variations. Inglehart and Welzel (2010) located countries using above-mentioned dimensions (Figure 2.1). In order to create these two dimensions, ten items are used in their factor analysis. As WVS contains these 10 items, we use all the ten items in order to create value types and value diversity measure.

Schwartz (1992, 1999) developed a framework of human values. Ten values are identified by Schwartz. Ten values are the goals of power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. WVS contains 10 questions called Schwartz items and each item corresponds to one of the ten Schwartz values. Therefore, we also construct value types and value diversity measure based on Schwartz items.

One of the objectives of our thesis is to construct value types and value diversity measures. In order to create these indices, this study uses data from WVS. The way of constructing these indicators are the followings. We first select questions from WVS that are used in a framework of Inglehart (Schwartz). Then, we classify individuals into groups using cluster analysis[3]. In doing so, individuals who made similar responses are grouped into the same value type. Therefore, individuals in the same value type share similar thoughts. As we come to know population shares of the value types in a country, we can calculate value diversity index. This

[3] Cluster analysis is the way of grouping a set of individuals in such a way that respondents in the same group (value type) are more similar to each other than to those in other groups (value types).

approach enables us to ignore many factors that were obstacle in previous study and enables us to see only similarities and dissimilarities in values. In this thesis, we seek the role of value type and value diversity. Contribution of the thesis and outline of the thesis are discussed in the next section.

1.2 Contribution and Outline of the Thesis

Researchers have been interested in the causes and impediments of economic growth. Institutions have been widely believed as an important determinant of economic development. According to North (1990, 3), “Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction. In consequence they structure incentives in human exchange, whether political, social, or economic.” Further North (1990, 4) mentions that “Institutions include any form of constraints that human being devise to shape human interaction. Are institutions formal or informal? They can be either, and I am interested both in formal constraints- such as rules that human being devise-and informal constraints- such as conventions and codes of behavior.” The aim of this thesis is not to discuss details of the terms formal institutions and informal institutions. Therefore, this thesis follows papers that use institutional quality as formal institutions and culture as informal institutions.

A considerable amount of literature has been published on the advantages of different aspects of formal institutions, such as property rights, quality of government, legal systems. One of the most common indicators of formal institutions is an index of property rights, protection against expropriation risk that is used in Acemoglu et al. (2001). This measure is provided by Political Risk Services. The World Bank assembles institutional measures and creates six categories for the quality of institutions-Rule of Law, Control of Corruption,

Government Effectiveness, Political stability and Absence of Voice / Terrorism, Regulatory Quality, Voice and accountability. Recent papers such as Rodrik et al. (2004) and Acemoglu et al. (2014) use the rule of law index[4] as an indicator for formal institutions. Rule of law is defined as "Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence (World Bank)" Acemoglu et al. (2014) states that the rule of law index captures "the most up-to date measure of broad institutions." This thesis uses the rule of law index as a measure of institutions in chapter 3.

In addition to the research of formal institutions, scholars have also investigated the role of informal institutions such as culture (Tabellini, 2010, Zak and Knack, 2001) in economic outcomes. One of the most studied informal institutions is generalized trust. Generalized trust is measured using the following question;

"Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?
1 Most people can be trusted, 2 need to be very careful.

This question is included in the World Values Survey (WVS), the General Social Survey (GSS), and the European Social Survey. Generalized trust is often measured by the fraction of individuals say "most people can be trusted". Further, many researchers try to use different aspects of informal institutions such as individualism (Gorodnichenko, 2010., Gorodnichenko and Ronald, 2011), respect (Tabellini, 2010, Breuer and Mcdermott, 2013) and responsibility (Breuer and Mcdermott, 2013). Common way to measure informal institution is to aggregate individual responses collected in the WVS. In our fourth chapter, we focus on

[4] from the Worldwide Governance Indicators (WGI)

specific values such as respect for others.

This thesis sheds lights on the use of hidden heterogeneity (value diversity) and share of value type by the study of the role of formal and informal institutions. It makes three contributions to the current literature. Firstly, in chapter 2, we discuss some shortcomings of prevailing measures of cultural diversity. Then, we construct and discuss the properties of new indices that are different from widely used indices. Using these indices, value type and value diversity, we make two additional contributions to the current literature. This thesis investigates the role of formal institutions (e.g. institutional quality) in economic performance in chapter 3. Finally, we see the impact of informal institutions (e.g. culture) on economic performance in chapter 4. To put it simply, chapters 3 and 4 investigate the effect of formal and informal institutions on economic performance using our measure created in chapter 2. In the following part, we list research questions and contributions of each chapter.

1.2.1 Contribution and Overview of Chapter 2

As discussed in “Background and Motivation”, there has been no discussion on the role of diversity in “internal traits” such as human values so that this chapter proposes a new aspect of cultural diversity measure that grasps diversity in human values. This chapter first examines problems associated with the prevailing measures of cultural diversity. To mitigate the problems, we introduce several measures. To construct them, we use Schwartz's, and Inglehart's frameworks. Using WVS, this chapter constructs our measures “value type” and “value diversity”. This chapter uses one of the automatic classification methods, cluster

analysis, and classifies respondents into several groups based on their ten items from Inglehart and Baker (2010). Therefore, individuals who are grouped into the same value type share similar thoughts and values. As a result of cluster analysis, we come to know population shares of each value type. Therefore, we can calculate value diversity. For instance, we create 3 value types-value type 1, value type 2 and value type 3. People in each value type share similar values. Therefore, we can say that the situation is similar to commonly used affiliations. Instead of using Muslim, we use value type 1. In addition, this study uses the proportions of the populations that are identified as value type 1 instead of the proportions of the populations that are identified as Muslim. After the creation of value diversity, we see characteristics our new measure. As a result, we obtain interesting findings. As a measure of value diversity, the latter half of this chapter uses value fractionalization. Some striking examples demonstrate that the value fractionalization captures perspective that is different from prevailing cultural fractionalization measures. For instance, Argentina can be considered ethnically homogenous, religiously homogeneous and linguistically homogeneous. However, Argentina is heterogeneous with respect to human values. On another front, Tanzania is fragmented with respect to ethnicity, religion and language. However, Tanzania is homogeneous with regard to human values. Above-mentioned examples and other examples demonstrate that value fractionalization captures a new aspect of heterogeneity in a country. Further, the use of cultural diversity based on human values has a number of attractive features. One of those features is that it enables us to observe value fractionalization for people whose farther/mother is immigrant. Further, it becomes possible to observe value fractionalization for male/female. This chapter also finds that our value fractionalization measure is robust to changing grouping method.

In summary, this chapter aims:

1 To review the role of cultural diversity in many aspects of society

2 To identify problems associated with widely used measure of cultural diversity such as ethnic, religious and language diversity.

3 To propose “value type” and “value diversity” using data from World Values Survey and to analyze the properties of our new indices

1.2.2 Contribution and Overview of Chapter 3

In chapter 3, the thesis seeks the role of formal institutions measured by rule of law index in economic performance using value fractionalization. More specifically, we assess the robustness of results obtained in the seminal article Acemoglu, Johnson and Robinson (AJR) (2001) and many other papers by using value fractionalization. AJR (2001) hypothesizes that the mortality rates faced by Europeans had influence on their settlements and choice of colonization strategy. It is argued that Europeans tend to live in places that are relatively healthier and this behavior leads to institutions with high quality. This hypothesis leads to a strategy of using IV estimation. They use potential European settler mortality as an instrument for institutional variation in former European colonies today. It is argued that settler mortality rate more than 100 years ago have no direct impact on current GDP per capita other than through development of institutions. We revisit this theory and seek alternative ways of investigating the effect of institutions on economic performance. We observe that the quality of institutions in the past seems to affect economic performance in the past. This is supported by data and recent studies on the role of institutions in economic performance. We further observe that early economic performance tended to persist. Therefore,

the use of historical variables as instruments for current institutions may lead to false results because historical variables may influence past economic performance via past institutions. Therefore, this chapter aims to investigate the impact of institutions on economic performance without using historical variables. Instead of using historical variables, we use value fractionalization which we created in chapter 2. As a measure of value fractionalization, we use value fractionalization based on cultural framework by Inglehart in this chapter. Here, we hypothesize that value fractionalization affects economic performance only through current institutions. One explanation is that, in highly fragmented countries with respect to human values, it is not easy to agree on the form of the institutions and institution is required to be more complicated. Further, our theory is supported by some papers that estimate the effect of the quality of institutions on economic performance using commonly used cultural diversity measure as instruments for institutions in IV estimation. Therefore, this chapter avoids some concerns applied to previous studies and plays a complementary role. Using value fractionalization, we improve robustness of the results obtained in AJR and show that the quality of institution has impact on economic development. The use of value fractionalization as an instrument for the quality of institutions makes it possible to mitigate concerns about the quality of historical data. In addition, we do not use the theory based on colonial policy so that our hypothesis improves the robustness of the results by including countries that have been less affected by Europeans. In addition, we perform several types of robustness checks in chapter 3. Firstly, we check whether our core result is robust to inclusion of variables such as dummies for British and French colonies. Secondly, we replace current institutions with the average value of institutions in order to avoid reverse causation. Thirdly, we test the validity of our approach by including value fractionalization as an exogenous variable. As a result, we find that the coefficient of value fractionalization is insignificant so that this supports that value

fractionalization is a valid instrument. Fourthly, we add panel estimations and show that our results are robust. Fifthly, by showing that the use of value fractionalization based on different definitions has no influence on our main results, we find that main results are robust to the definition of value fractionalization. Finally, additional robust tests are performed in the chapter.

In summary, this chapter aims:

1 To revisit the existing theory constructed by AJR, 2001.

2 To seek alternative ways of investigating the impact of institutions on economic performance. More specifically, we use value fractionalization instead of historical variables as instrument for institutions in IV estimation.

3 To determine whether institution plays an important role not only for ex-colonies but also for countries less affected by the Europeans.

1.2.3 Contribution and Overview of Chapter 4

Causal effect of culture on economic outcomes has been widely investigated (Breuer and McDermott, 2013; Gorodnichenko and Roland, 2011; Guiso et al., 2006; Knack and Keefer, 1997; Tabellini, 2010). In this chapter, we attempt to reevaluate the effect of culture on economic outcomes. The difficulty of estimating the impact of culture stems from the influence of economic development on social life (Inglehart and Baker, 2010). That is, causality between culture and economic outcomes can be in both directions. Therefore, we try to find exogenous source of variation in culture and use an instrumental-

variables approach in this chapter. Tabellini (2010) uses the literacy rate in Europe at the end of the nineteenth century and the past political institutions as instruments for culture in the analysis. Our approach draws from Guiso et al. (2006), Breuer and Mcdermott (2013) and Zak and Knack (2001). In Guiso et al. (2006), trust is instrumented using the religious denominations and the country of origin of the ancestors. The instruments used in Breuer and Mcdermott (2013) contain religion and Zak and Knack (2001) use the religious denominations as instruments for trust.

Our strategy is to use value affiliation (value type) as an instrument for culture in IV estimation. Unlike previous studies that recognize historical variables and religious affiliations as exogenous source of variation in culture, we identify proportion of value types as exogenous sources of variation in culture[5]. In order to construct value type, we use Schwartz's framework in this chapter. There are several advantages for our approach. Firstly, as argued in "Background and Motivation", lack of a uniform criterion to define religious affiliation leads to our approach that avoids the use of the proportion of religion in a country. Secondly, the use of historical variables as instruments for current culture may lead to misleading conclusions because historical variables may have an impact on past economic performance through past culture and past economic performance persisted to the present. Finally, the use of religious affiliation is not so convincing for some specific countries. According to the WVS, only 27 percent of people agree with the importance of religion in Sweden. In Japan, 21 percent of individuals think that religion is important or rather important[6]. Further, in 2010, it is shown that 76.4 percent of people in Czech Republic are religiously unaffiliated. In Japan

[5] We assume that proportion of cultural traits in a society affects creation of culture. As the probability of meeting with the same value type depends on the population shares of value types in a society, proportion of value type affects creation of culture.

[6] In contrast, about 100 percent of people in Egypt, Jordan, and Libya think that religion is important or rather important in their lives

57 percent of country population is classified as unaffiliated (Pew Research Reports). It is beneficial to seek for alternative instruments because religion may have a small impact on formation of culture in some non-religious countries. As a measure of culture, we see the role of respect for others (respect, for short) on economic performance. Respect has been considered as one of the key determinants of economic development and constructed using WVS. We find that value type, proportion of individuals who share similar thoughts and values, plays an important role in estimating the impact of culture on economic performance.

This chapter follows Breuer and Mcdermott (2013) so that respect is instrumented using two instruments. They use civil liberty index as one of the instruments for respect because the protection of civil liberties affects culture. We follow this way and exploit civil liberty index as one of our instruments. Another instrument they used is that the proportions of the populations that are identified as Catholic or Protestant. Instead of this instrument, we use "the proportions of the populations that are identified as a certain value type." This is because proportion of value type seems to affect creation of values and has no direct impact on economic outcomes.

Our results show that respect for others has positive impact on economic outcomes and are robust to various treatments and under alternative samples. We are also interested in countries where people think that religion is not so important in their lives. According to our results, we find that respect for others affects economic outcomes not only in religious countries but also in non-religious countries. In addition, this chapter performs several types of robustness checks. First, we include 10 variables, one at a time, that are candidate for omitted variables- "Trust", "Independence", "Hard work", "Feeling of Responsibility", "Imagination", "Thrift saving money and things", "Determination perseverance", "Religious faith", "Unselfishness", and "Obedience". The effect of respect on economic outcomes remains significant. Second, we check if our core result is

robust to inclusion of variables such as dummies for French legal origin and ethnic fractionalization. Third, we add trust that is believed to have impact on economic outcomes. Finally, we change criteria for selecting religious countries and non-religious countries. Despite several treatments mentioned here this chapter finds that the main results remain.

In summary, this chapter aims:

1 To review the role culture in economic performance.

2 To identify problems associated with previous studies that estimate the impact of culture on economic outcomes. More specifically, we argue the validity of the use of historical variables and religious affiliation as instruments for culture in IV estimation.

3 To check robustness of previous literature that shows the impact of culture on economic performance by using alternative instrument (value type).

4 To investigate the role of culture not only for full sample but also for non-religious countries. Our strategy does not rely on religion so that we investigate the role of culture not only for full sample but also for non-religious countries.

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Chapter Two: Cultural Diversity based on Human Values

Chapter Overview

The role of cultural diversity in economic outcomes, government performance and social stability has been empirically investigated. The measures of cultural diversity mainly focus on diversity of ethnicity, religion and language. However, there has been little discussion about diversity in human values. This section identifies problems associated with the current measurement of ethnic, religious and language diversity. Then, this study proposes an index of “diversity in human values” using data from World Values Survey. The purpose of this chapter is to construct a new measure of cultural diversity that focuses on people’s values and to examine the significance of introducing the new measure “value diversity”.

2.1 Introduction

A considerable amount of literature has been published on the role of cultural diversity. Much of the current literature on cultural diversity pays attention to diversity of ethnicity, language, and religion. Cultural diversity affects economic growth (Easterly and Levine, 1997 and Alesina and La Ferrara, 2005), trust (Zak and Knack, 2001), government performance (Alesina et al. 2003 and La porta et al., 1999), social stability (Nettle et al., 2007), and democratization (Akdede, 2010). Cultural diversity has positive and negative effects on society.

This chapter first examines problems with the prevailing indices of cultural diversity. Previous studies on cultural diversity mainly focus on diversity of ethnicity, religion and language. However, there has been no discussion on the impact of diversity of internal traits such as human values. A characteristic of this chapter lies in proposing a new index of cultural diversity based on human values. We call this new index "value diversity". As a measure of value diversity, we propose "value fractionalization" and "value polarization". This chapter also constructs the proportion of the people who share similar values. This chapter discusses the advantage of introducing value diversity mainly from the difference between diversity in internal traits and external traits. We then discuss the significance of our measures in economic analysis in chapters 3 and 4. As a starting point, it is important to investigate how to measure value diversity.

In order to construct value diversity, it is required to recognize important dimensions of human values. This chapter mainly uses Inglehart's approach to human values. According to Inglehart's approach, human values can be represented in a 2-dimensional value space (Inglehart and Baker, 2000). World Values Survey (WVS)[7] is used to construct value diversity index. The way of

[7] World Values Survey is designed to enable a cross-cultural comparison of many aspects values and norms. See http://www.worldvaluessurvey.org/wvs.jsp/ for a

creating value diversity index is the following. Firstly, this study selects some survey questions which are important dimensions of human values. Secondly, individuals who made similar responses are classified into the same group. This study calls this group "value type"[8]. Finally, we derive value diversity index from the population shares of the value types in a country.

Difficulty in measuring widely used fractionalization measure is argued in Fish and Brooks (2004). They state that "Freedom House provides information on the size of what it defines as ethnic groups. Freedom House's numbers on ethnic composition are vulnerable to criticism. Perhaps the most serious deficiency is the absence of a uniform criterion to define ethnicity…Thus for Freedom House, "ethnicity" may refer to race (meaning physiognomy and skin color), language, religion, or some combination thereof." As we automatically divide individuals into value types, our measure mitigates this problem. In addition to this, the significance of introducing value diversity is as follows. Unlike using external traits such as ethnicity, it makes it possible to address the role of fractionalization in internal traits such as values and beliefs. Our index of cultural diversity is better suited to capture cultural diversity in internal traits than commonly used measures.

Moreover, as globalization advances, it becomes difficult for each individual to identify her own ethnicity, religion or language. For example, a person who brought up with more than one language finds it difficult to identify her native language. Introduction of diversity measure based on human values will be useful in order to solve the above-mentioned difficulties.

In addition, the introduction of diversity in internal traits contributes to evaluate economic problem. This is because value diversity affects

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detailed description of WVS

[8] Suppose we construct 3 value types-value type 1, value type 2 and value type 3. It means that individuals in value type 1 made similar responses to the survey questions. The same is true of value type 2 and value type 3. We treat value types as ethnic, language or religious affiliations. Therefore, we use the proportions of the populations that are identified as value type 1, value type 2 and value type 3 to create value diversity.

institutions, which in turn impacts economic performance (Acemoglu et al. 2001). Basically, people in a country create institutions as they like so that value diversity has a certain impact on institutions. Human values are hidden but, hidden heterogeneity affects institutions. For instance, when people vote, they express their values. The quality of institutions is partly determined by voting results so that value diversity affects institutions.

This chapter makes the following contributions to the current literature. Firstly, this study adds new dimension of cultural diversity that is different from ethnic, religious and linguistic diversity. Further, we construct value diversity index based on other definitions. Positive and significant relationships are found between our measure and value diversity indices based on other definitions. Moreover, this study observes some interesting properties of value fractionalization. Finally, the measures created in this chapter are found to be useful for estimating the impact of institutions on economic performance. More specifically, the use of new measures makes it possible to avoid some concerns of possible criticism applied to previous work. Further, our knowledge of the impact of institutions on economic performance is complemented by the use of our new measures[9].

The remainder of this chapter is organized as follows. Section 2.2 describes positive and negative aspects of cultural diversity. Section 2.3 provides commonly used measures of cultural diversity. Section 2.4 presents the significance of creating cultural diversity measure based on human values. It also introduces two cultural frameworks- Cultural framework by Inglehar and by Schwartz. Then, we create value type and cultural diversity measure based on human values in this section. Section 2.5 provides attractive features of our approach. Section 2.6 summarizes the study and provides concluding remarks.

[9] See chapters 3 and 4.

2.2 Cultural Diversity

The positive and the negative aspects of cultural diversity are discussed in this section.

A large number of literatures have investigated the effects of cultural diversity on economic outcomes. Ager and Bruckner (2011) investigate the effect of immigration in US counties for the time period between 1870-1920. They find that culturally fragmented counties inclined to experience the increases in output per capita. According to Nettle (2000), linguistically homogeneous countries tend to be wealthier than linguistically fragmented countries. Nettle et al. (2007) show that linguistic fragmentation leads to poor economic performance. Easterly and Levine (1997) show that ethnic fragmentation negatively affects economic growth in Africa. This implies that ethnic fragmentation is a factor of Africa's poor economic performance. Alesina and La Ferrara (2005) show that ethnic fragmentation and linguistic fragmentation have negative impacts on per capita growth.

Recent research show that trust contributes to economic success. In Zak and Knack (2001), it is shown that social homogeneity promotes trust. They show that higher trust increases investment and growth controlling for the factors that predict economic performance. Knack (1999) argues that high-trust societies can achieve higher economic growth due to lower transaction costs. According to Knack and Keefer (1997), innovation hardly takes place in low-trust societies. It is argued that, in low-trust societies, entrepreneurs need to devote more time monitoring their employees instead of devoting more time innovating new products. As described above, trust plays an important role in economic outcomes and a large and growing body of literature has investigated determinants of trust. Ethnic diversity is generally associated with lower levels of trust (Knack and Keefer, 1997; Alesina and La Ferrara, 2002). There are two hypotheses explaining the relationship between ethnic diversity and trust: conflict hypothesis and contact

hypothesis. Conflict hypothesis states that intergroup contact will lead to an increase in conflict, as groups compete, or perceived themselves to be competing, over finite material resources (Dincer, 2011). According to the conflict hypothesis, cultural diversity decreases trust. People inclined to socialize with people who are similar to themselves (Delhey and Newton 2005). Therefore, the more people live in a society with people who belong to another ethnic group, the more they trust their own group and the less they trust the other group. Using cross-country data, Delhey and Newton (2005) find a negative relationship between ethnic diversity and trust. Alesina and La Ferrara (2002) find a negative relationship between ethnic fractionalization and trust using U.S data from General Social Survey (GSS). According to contact hypothesis, as people have more contact with people who belong to other ethnic groups, they trust them more. Uslaner (2006) states that cultural diversity leads to lower trust if there is lack of contact between people who belong to different ethnic groups. Using U.S. and Canadian data, Stolle et al. (2008) find that people who are regularly in contact with the other people are less affected by their ethnicity than people who lack contact.

Alesina, Baqir, and Easterly (1999) find that, in the US, cities and counties with high ethnic fractionalization tend to spend less on public goods such as education, roads, swearers and trash pickup. Thus, there is a negative link between ethnic fractionalization and investment in public goods.

There are papers that investigate the link between cultural diversity and social instability. Nettle et al. (2007) explore the relationship between ethnic diversity, religious diversity, linguistic diversity and societal instability using Structural Equation Modelling. An index of political instability and an index of the occurrence of revolutions and coups are used as a proxy for societal instability. According to their result, there is a positive relationship between linguistic fractionalization and social instability. There is a large volume of published studies describing the role of cultural diversity in civil war. Some

show that ethnic diversity cause civil war (Reynol-Querol, 2002). However, there is no evidence that religious diversity has this effect (Gerring et. al.,2014)

A large and growing body of literature has demonstrated that people of different cultures play games differently (Roth et al., 1991). In contrast to cross-cultural experiments, game experiments between subjects from heterogeneous cultures are not widely investigated. Oxoby and Spraggon (2006) find that heterogeneity of subjects decreases cooperation in public goods game experiment. Castro (2008) shows that contribution level in public goods game experiment becomes lower when British and Italian subjects are grouped together compared to when they are in groups with the same nationality. Hence, in game experiment, heterogeneity of subjects may affect negatively to cooperative actions. Cultural diversity is closely related to heterogeneity of subjects. Thus, these results imply that cultural diversity negatively influences subjects' cooperative behavior in public goods game experiment.

The effects of cultural diversity on democratization have been investigated. Akdede (2010) investigates the link between cultural diversity and democratization during the time period 1992 and 2006. The result shows that democratization is not affected by ethnic fractionalization. However, religious fractionalization affects democratization. Higher religious diversity leads to democratization.

With regard to the relationship between cultural diversity and government performance, La Porta et al. (1999) find that ethno-linguistically homogeneous countries tend to have better government performance. Alesina et al. (2003) show that ethnic and language diversity are important not only in economic success but also in the literacy rate, the infant mortality and the quality of government. Further, it is shown that religious diversity has no effect on the quality of government.

As shown in this section, many researchers have been investigated the role

of cultural diversity in various aspects of society. Definition of cultural diversity measure is argued in the next section.

2.3 Fractionalization and Polarization

Before turning to construct cultural a diversity measure based on human values, this section briefly discusses the prevailing measure of cultural diversity. In order to measure cultural diversity, fractionalization index and polarization index are widely used in current literature. The fractionalization index measures the probability that two randomly selected individuals in a society are from different cultural groups and it is calculated as follows.

$$Fractionalization \equiv 1 - \sum_{i=1}^{n} p_i^2$$

Where the population shares of the cultural groups in a society are denoted as $p_1,\ p_2,\ p_3,,,,\ p_n$ and n is the number of cultural groups[10].

This index takes 0 to 1 and is maximized when every individual in a society belongs to different cultural group.

As stated in section 2.2, a considerable amount of literature has been published on the role of cultural fractionalization in economic outcomes. It has been shown that cultural fractionalization seems to be a good explanatory variable for economic growth. However, Fearon and Latin (2003) find that ethnic fractionalization and religious fractionalization have no effect on the probability of civil wars. Instead, Montalvo and Reynal-Querol (2005) use polarization index to measure cultural diversity.

The polarization index captures how far the distribution of the cultural groups is from a society dominated by two equal-size cultural groups. It is calculated as

[10] Note that this measure is based on binary criteria of “belonging” or “not belonging”. This is because we used number of cultural groups here. Therefore, this index ignores the distance between cultural groups.

$$Polarization \equiv 1 - \sum_{i=1}^{n} (\frac{0.5 - p_i}{0.5})^2 p_i$$

Again, the population shares of the cultural groups in a society are denoted as $p_1,\ p_2,\ p_3,,,,\ p_n$ and n is the number of cultural groups. This measure is maximized when two groups are of equal size.

Table 2.1 shows some examples of fractionalization index and polarization index. In country D, people are evenly split between 3 cultural groups. In this case, cultural fractionalization is 0.67 and cultural polarization is 0.89. In country F, cultural fractionalization and cultural polarization is 0.75. Above-mentioned measures of cultural diversity mainly focus on diversity of ethnicity, religion and language. The next section of this chapter uses the fractionalization index and polarization index to construct value fractionalization and value polarization.[11]

Table 2. 1 Example-Cultural Fractionalization and Cultural Polarization

Country	Number of Groups	Population Shares	Fractionalization	Polarization
A	2	(1.0, 0.0)	0	0
B	2	(0.8,0.2)	0.32	0.64
C	2	(0.5, 0.5)	0.5	1
D	3	(0.33, 0.33, 0.33)	0.67	0.89
E	3	(0.2, 0.2, 0.6)	0.56	0.83
F	4	(0.25, 0.25, 0.25, 0.25)	0.75	0.75

Notes: "population shares" denotes the population shares of the cultural groups in a country. In Country A, Country B and Country C, there are two cultural groups. As for Countries D and E, there are three cultural groups. Four cultural groups exist in Country F.

[11] We are interested in cultural diversity within a nation. Some papers also focus on diversity between a nation (Nettle et al., 2007).

2.4 Cultural Diversity based on Human Values

This section discusses the significance of constructing cultural diversity measure based on human values. Further, this section introduces two cultural frameworks- Cultural framework by Inglehart and by Schwartz. Then, we create value type and cultural diversity measure based on human values.

2.4.1 Why Cultural Diversity based on Human Values ?

A measure of diversity in human values addresses some shortcomings of previous studies. There are three advantages of introducing diversity measure based on human values.

Firstly, value diversity may capture new aspect of cultural diversity. There is a large volume of published studies describing the role of cultural diversity in economic outcomes and social indicators. However, previous studies on cultural diversity mainly focus on diversity of ethnicity, religion and language and there has been little discussion on the role of diversity in human values. Previous measures of cultural diversity based on “external traits”. On the other hand, value diversity measures cultural diversity based on “internal traits” such as belief and human values. Having not only diversity in external traits but also in internal traits can be beneficial.

The second advantage of using value fractionalization is that cultural diversity based on human values may solve some problems of using ethnicity, religion and language as a measure of cultural diversity. Recently, it becomes difficult for people to identify their own ethnicity, religion or language. As for language, a person who can speak more than one language fluently finds it difficult to identify her native language. Regarding ethnicity, Fish and Brooks (2004) state that ethnic affiliation seems to be vulnerable to criticism

because definition of ethnicity is somewhat ambiguous. With regard to religion, some people have more than one religion. According to the CIA World Fact Book, 83.9 percent of Japanese are classified as Shintoism, 71.4 percent as Buddhism, 2 percent as Christianity, and 7.8 percent as others. Total exceeds 100 percent because many Japanese belong to both Shintoism and Buddhism (CIA Fact Book). Worse, 57 percent of people in Japan are religiously unaffiliated (Pew Research Reports). Therefore, it might be difficult to grasp accurate proportion of religious, language, and ethnic affiliations.

In contrast, this chapter automatically classifies individuals into several groups so that our measure mitigates the concern that definition of cultural group might be ambiguous. Further, as we classify individuals into value types total is always 100 percent and this suits the definitions of fractionalization and polarization indices. Moreover, as stated in section 2.2, introduction of value diversity enables us to investigate the role of diversity in internal traits that has not been investigated in current literature.

2.4.2 Cultural Framework

2.4.2.1 Cultural Framework by Inglehart

World Values Survey (WVS) provides a cross-cultural measure of peoples' values. Many aspects of human values (concern) such as attitude toward politics, economy, religion and family are asked in the survey. To date various methods have been developed and introduced to identify the character of values useful in describing cultures. This study highlights two frameworks to describe cultures. That is cultural framework by Inglehart and cultural

framework by Schwartz.

Inglehart (1997) proposes a cultural framework using data from WVS. The study analyzes 43 societies based on 22 items from WVS. By principal components factor analysis, it is found that first two dimensions account for 51 percent of the cross-national variation among these items. Further, additional dimensions explain relatively small amount of cross-national variations among them. It is reported that these two dimensions are robust to dropping items included in the research. Inglehart and Baker (2000) extracted two factors at both individual and country levels using 10 items from WVS. They named two factors "traditional versus secular-rational[12]" dimension and "survival versus self-expression[13]" dimension. These two dimensions are robust because many researchers obtained similar results from other combinations of survey questions from WVS[14]. Survey questions that Inglehart and Baker (2000) used are shown in Table 2.2. Traditional values emphasize "Importance of God", "Teach Children Obedience and Faith rather than Independence and Determination", "Disapproval of Abortion", "National Pride", and "Respect for Authority". On the other hand, survival values emphasize "Priority for Economic and Physical Security", "Feeling of Unhappiness", "Abstaining from Signing Petitions", "Disapproval of Homosexuality" and "Distrusting in Other People"

[12] Secular-rational values have the opposite preferences to the traditional values.

[13] Self-expression values have the opposite preferences to the survival values.

[14] According to Inglehart and Welzel (2010), "The resulting cross-cultural map is so robust that, using a completely different way of measuring basic values, different types of samples and a different type of dimensional analysis Schwartz finds very similar transnational groupings among 76 countries". Further, "traditional versus secular-rational" dimension and "survival versus self-expression" dimension appear in analysis using different sets of years and countries (Inglehart, 1997; Inglehart and Baker, 2000, Inglehart and Welzel, 2005).

Table 2. 2 Ten Items for Inglehart's Dimensions

Traditional vs. Secular-Rational values (Traditional values emphasize the following)
God is important in respondent's life.
It is more important for a child to learn obedience and religious faith than independence and determination (i.e.Autonomy index).
Abortion is never justifiable.
Respondent has strong sense of national pride.
Respondent favors more respect for authority
Survival vs. Self-Expression values (Survival values emphasize the following)
Respondent gives priority to economic and physical security over self-expression and quality-of-life (i.e. Materialist/Postmaterialist values index)
Respondent describes self as not very happy.
Respondent has not signed and would not sign a petition
Homosexuality is never justifiable.
You have to be very careful about trusting people.

Source: Inglehart and Baker (2000, p24)

These two dimensions explain more than 70 percent of the cross-national variance on these items. These dimensions make it possible to locate individuals and each society on a global map[15]. Figure 2.1 shows the locations of societies based on these two dimensions in wave 4, 1996. Average score of traditional vs. secular-rational score and survival vs. self-expression score are used to derive national scores. We can see similarities between cultures by this map. A cultural map in wave 5 (2008) is shown in Appendix-Figure 2.1 Further, a map in wave 6 (2010-2014) is shown in Appendix-Figure 2.2.

We observe that Protestant Europe such as Sweden has high scores in Secular-rational and Self-expression values. Countries in Ex-communist tend

[15] This thesis aims to seek diversity in human values so that we are not going to place individuals into this cultural map. Therefore, this thesis uses items that are used to create "traditional versus secular-rational" dimension and "survival versus self-expression" dimension.

to have high scores in Secular-rational and Survival values. Further, English speaking countries inclined to have high Traditional and Self-expression values.

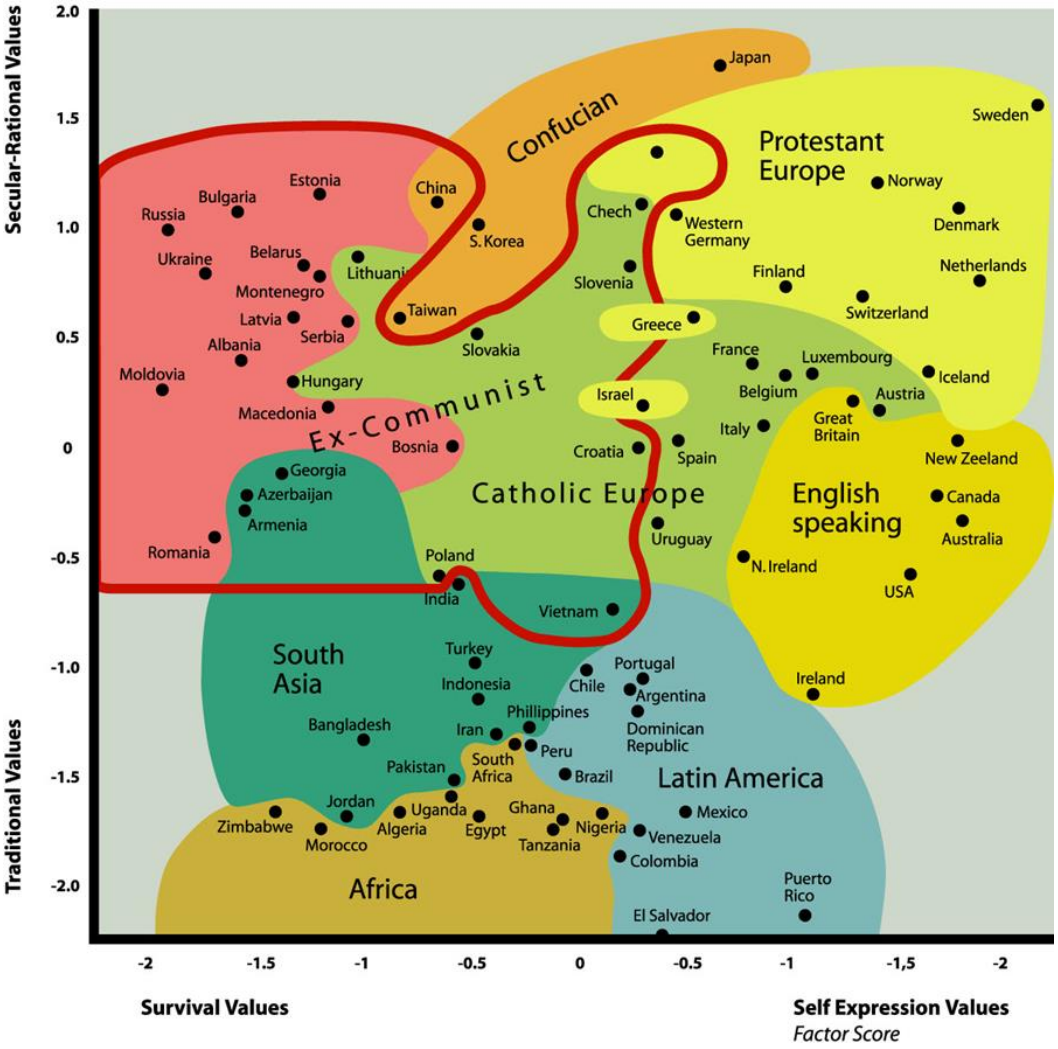


Figure 2. 1 Map of countries (wave 4, 1996)

Source: World Values Survey
Extracted from: http://www.worldvaluessurvey.org/WVSContents.jsp

2.4.2.2 Cultural Framework by Schwartz

Schwartz (1992, 1999) discusses basic human values. Schwartz (1992) states

that “Values (a) are concepts or beliefs, (b) pertain to desirable end states or behaviors, (c) transcend specific situations, (d) guide selection or evaluation of behavior and events, and (e) are ordered by relative importance. (page 4)”. Further it is stated that “the primary content aspect of a value is the type of goal or motivational concern that it expresses. (page 4)”. Schwartz adopts widely used conception of values (Feather, 1995 etc.) and proposed 10 Schwartz values that relates to motivational goal.

The following are the 10 broad basic values that Schwartz specifies,
each followed by its motivational goal:

In Schwartz (1992), the following ten different types of human values are shown.

Power: Social status and prestige, control or dominance over people and resources

Achievement: Personal success through domonstrating competence according to social Standards

Hedonism: Pleasure and sensuous gratification for oneself.

Stimulation: Excitement, novelty, and challenge in life.

Self-direction: Independent thought and action-choosing, creating, exploring.

Universalism: Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.

Benevolence: Preservation and enhancement of the welfare of people with whom one is in frequent personal contact.

Tradition: Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide.

Conformity: Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.

Security: Safety, harmony, and stability of society, of relationships, and of self.

Schwartz summarized these 10 values with the following two orthogonal dimensions; Self-enhancement vs. self-transcendence dimension and Openness to change vs. Conservatism dimension. Appendix-Figure 2.3 shows relations between ten motivational types of value. Further, the followings show the explanation for each dimension.

Two dimensions by Schwartz
Self-enhancement vs. Self-transcendence:
“This dimension captures the conflict between values that emphasize concern for the welfare and interests of others (universalism, benevolence) and values that emphasize pursuit of one's own interests and relative success and dominance over others (power, achievement). Hedonism shares elements of both openness to change and self-enhancement (Schwartz, 2012).”
Openness to change vs. Conservatism:
“This dimension captures the conflict between values that emphasize independence of thought, action, and feelings and readiness for change (self-direction, stimulation) and values that emphasize order, selfrestriction, preservation of the past, and resistance to change (security, conformity, tradition) (Schwartz, 2012).”

WVS contains 10 questions that represent these 10 values. This paper uses cultural framework by Schwartz in chapter 4 so that we discuss them later.

2.4.3 Value Types

In contrast to ethnicity, language, and religion there are no pre-determined groupings for human values. There are many ways to group individuals into some groups that share similar values. Suppose we select one dichotomous

question from WVS. Then, it is easy to classify individuals into two value types. “Value type A” consists of individuals who answered YES to the question and “Value type B” consists of individuals who answered NO. However, this way captures only one aspect of human values. Another simple way to create value type is to classify individuals into four groups as follows:

Suppose there are 2 questions, Question A and Question B.
Group 1; Positive response to Question A and Positive response to Question B
Group 2; Positive response to Question A and Non-positive response to Question B
Group 3; Non-positive response to Question A and Positive response to Question B
Group 4; Non-positive response to Question A and Non-positive response to Question B

This grouping method captures two aspects of human values at the same time. However, it is doubtful to say that Question A and Question B are important dimensions of human values. Therefore, instead of using a simple way, this study uses k-means cluster analysis in order to classify respondents into groups. By this grouping method, individuals in the same group share common characteristics. We call these groups “value types”.

Cluster analysis is the way of partitioning individuals into a small number of groups. Suppose we have n individuals (observations) and we are going to partition them into k groups (clusters). In this case, our goal is to assign a group to each individual. Firstly, cluster analysis initializes the centre of the clusters. Then, (1) we calculate the Euclidean distance between the observation and the cluster centre and assign a group to the cluster whose distance from the cluster centre is minimum among all the other clusters. (2) A new cluster centre will then be recalculated as the position of each cluster to the mean for observations in each cluster. Cluster analysis performs (1)

and (2) in a loop until no more relocations occur. That is, the iteration stops when each observation is nearest to its own cluster centre than that of the other cluster.

This section constructs value type and value diversity using Inglehart's approach. The third wave to the sixth wave of WVS data is used. We excluded the first two waves because these waves are weighted with developed countries. We use data collected in Wave 3 (1994-1998), Wave 4 (1999-2004), Wave 5 (2005-2009) and Wave 6 (2010-2014).

Using 10 Inglehart items[16], we first group individuals into three groups (value types) by cluster analysis[17]. We call these groups value type 1, value type 2, and value type 3. Therefore, individuals classified as each value type share similar values. More precisely, respondents in value type 1 made similar responses to the 10 items. The same is true of people classified as value type 2 and value type 3. As the same religious affiliation share the same religion, the same value type share the similar values. Now we come to know population shares of each value type in each wave, it is possible to create proportion of each value type by wave.

Appendix-Table 2.1, 2.2, 2.3, and 2.4 show the distribution of the population of value types among the countries in each wave. Table 2.3 shows value type and main society of each value type. An individual classified as "Value type 1" tends to abstain from petition and disapprove abortion. It is found that many people in South Asia and Africa are grouped into value type 1. In wave 5, 92.21 percent of people in Rwanda are value type 1. As for Jordan, 99.02 percent of respondents are classified as value type 1. Value type 2 mainly consists with people who do not show greater respect for authority and people who trust others compared with other value types. We

[16] See Appendix 2.4 "Ten items from cultural framework by Inglehart" for details

[17] This chapter chooses three value types because grouping into two types is close to population shares rather than diversity. Further, we do not use more than three types because it is complicated. Section 2.5.2 considers whether our diversity measure is robust to defining value fractionalization in different number of groups and shows that value fractionalization measure is robust to changing number of groups.

observe that many individuals in Protestant Europe and Confucian countries are classified as value type 2. As seen in Appendix-Table 2.4, 72.51 percent of people are value type 2 in Sweden (wave 6). According to Appendix-Table 2.3, 66.92 percent of individuals are classified as value type 2 in wave 5. On the other hand, 0 percent of people in Jordan are classified as value type 2 in wave 4. In addition, 0.36 of people in Jordan have value type 2. This means that it is difficult for people classified as value type 2 to meet with people who share similar values in Jordan. Individuals classified as value type 3 have a tendency to approve homosexuality and show greater national pride. In USA, 46.65 percent of respondents are classified as value type 3 in wave6. USA and Canada have many value type 3 individuals. The next section constructs value type and value fractionalization for each wave. Then, we see the properties of them.

Table 2. 3 Value Types and Main Societies

Value type		Main Society
Value type 1	Abstain from petition and disapprove abortion	Algeria Bangladesh Jordan Morocco Nigeria
Value type 2	Do not show greater respect for authority and people who trust others	China France Germany Japan Norway Swedem
Value type 3	Approve homosexuality and show greater national pride	United States Canada

Notes: People in value type 1 mainly consist with individuals who tend to abstain from petition and disapprove abortion compared with other value types. In comparison with other value types, individuals classified as value type 2 do not show greater respect for authority and do not trust others. People in value type 3 tend to approve homosexuality and show greater national pride. “Main society” means that most of the people in Algeria are classified as value type 1.

2.4.4 Value Diversity: Value Fractionalization and Value Polarization

As a measure of value diversity, we propose "value fractionalization index[18]" and "value polarization index[19]". Value fractionalization is calculated from fractionalization index and value polarization is calculated using polarization index. As seen in Appendix-Table 2.1-2.4, we know the population shares of the value types in a society, we can create value fractionalization and value polarization by wave. These indices are calculated as follows.

$$Value\ \ Fractionalization\ \ at\ \ wave\ \ t \equiv 1 - \sum_{i=1}^{n} p_{it}^2$$

$$Value\ \ Polarization\ \ at\ \ wave\ \ t \equiv 1 - \sum_{i=1}^{n} (\frac{0.5 - p_{it}}{0.5})^2 p_{it}$$

where the population shares of the value types in a country at wave t are denoted p_{1t}, p_{2t},, p_{nt} and n is the number of groups. In the previous section, we used three groups. As we grouped individuals into three groups in section 2.4, we basically assume $n = 3$.

Table 2.4 and table 2.5 provide heterogeneous countries and homogeneous countries with respect to human values. As can be seen from the tables, Canada is highly fragmented with respect to human values. In wave 4, 30.73 percent of individuals are value type 1. 24.97 percent of people are classified as value type 2 and 44.3 percent as value type3. Therefore, in wave 4, value fractionalization index for Canada is 0.65 and 0.64 in wave 5. Canada has the highest value fractionalization scores in wave 4 and wave 5.

On the other hand, Jordan is one of the most homogeneous countries with

[18] The term value fractionalization is used in this thesis to represent one of the measures of diversity in human values. Value fractionalization captures the probability that two randomly selected individuals in a society have different value types.

[19] The term value polarization has been used as one of the indicators of cultural diversity based on human values. Value polarization captures how far the distribution of value types is from bipolar (1/2,1/2, 0, 0, ..,0) which represents the highest (1) polarization.

regard to human values. 97.89 percent of individuals are classified as value type 1, 0 percent as value type 2 and 2.11 percent as value type 3 in Jordan (wave 4)[20].

Table 2. 4 Heterogeneous Countries (Value fractionalization)

Wave 3		Wave 4		Wave 5		Wave6	
Croatia	0.66	Canada	0.65	Canada	0.64	Uruguay	0.66
Slovakia	0.66	Spain	0.65	Australia	0.64	Russia	0.65
Finland	0.66	Israel	0.64	Bulgaria	0.64	United States	0.63
Albania	0.66	Moldova	0.62	Russia	0.63	South Korea	0.62
Spain	0.66	South Korea	0.61	Ukraine	0.63	Germany	0.62
Mean	0.55	Mean	0.40	Mean	0.49	Mean	0.41

Notes: The number shows value fractionalization index in each wave. Heterogeneous countries with respect to human values are shown in the table. Wave 3 (1994-1998), Wave 4 (1999-2004), Wave 5 (2005-2009) and Wave 6 (2010-2014).

Table 2. 5 Homogeneous Countries (Value fractionalization)

Wave 3		Wave 4		Wave 5		Wave6	
India	0.42	Zimbabwe	0.08	Ethiopia	0.20	Tunisia	0.14
South Africa	0.38	Bangladesh	0.07	Georgia	0.19	Pakistan	0.12
Puerto Rico	0.34	Jordan	0.04	Rwanda	0.15	Morocco	0.11
Venezuela	0.32	Indonesia	0.03	Indonesia	0.12	Jordan	0.10
Nigeria	0.19	Pakistan	0.02	Jordan	0.02	Ghana	0.09
Mean	0.55	Mean	0.40	Mean	0.49	Mean	0.41

Notes: The number shows value fractionalization index in each wave. Homogeneous countries with respect to human values are shown in the table. Wave 3 (1994-1998), Wave 4 (1999-2004), Wave 5 (2005-2009) and Wave 6 (2010-2014).

The difference between value fractionalization and value polarization can be observed in Figure 2.2. The figure plots value fractionalization index and value polarization index in wave 3. As seen in the figure, there is a significant positive correlation between value fractionalization index and value

[20] Appendix-Table 2.2

polarization index. This relationship can be seen in wave 4, wave 5, and wave 6. Therefore, this thesis mainly uses value fractionalization index as a measure of value diversity.

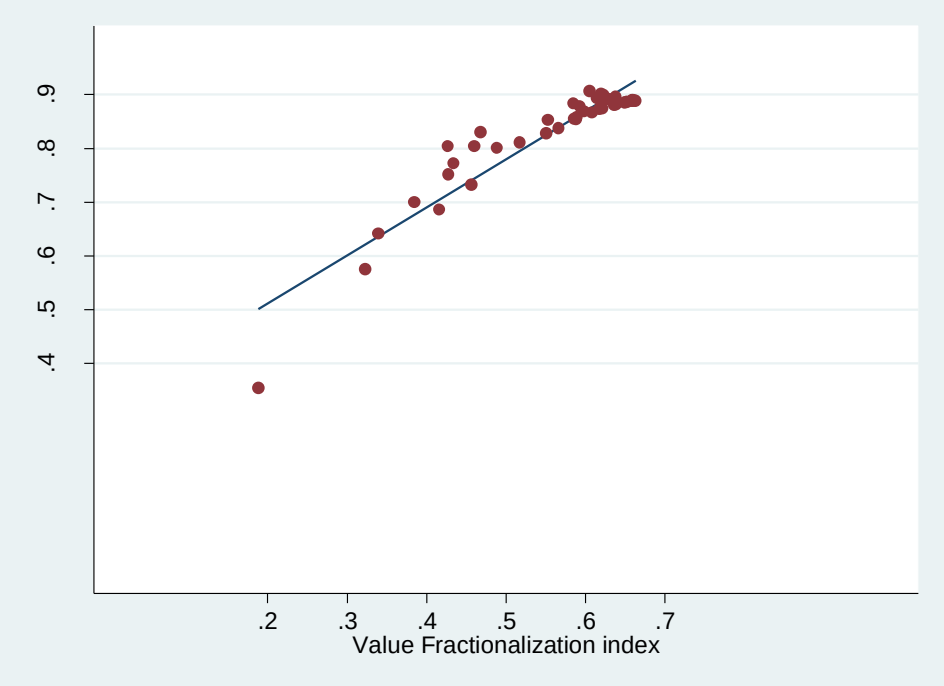


Figure 2. 2 Value Fractionalization index and Value Polarization index in Wave 3.

Notes: The Vertical Axis Value polarization index; The Horizontal Axis Value Fractionalization index

2.5 Merits

2.5.1 Comparison with Existing Measures

Using cultural diversity data from Alesina et al. (2003) [21], this section observes the link between value fractionalization index and widely used measures of cultural fractionalization. We first aggregate all individuals and calculate value fractionalization for each country. Therefore, we ignore

[21] Fractionalization index that is defined in section 2.3 is used in Alesina et al. (2003).

waves. Figure 2.3 presents simple plots of value fractionalization and ethnic fractionalization.

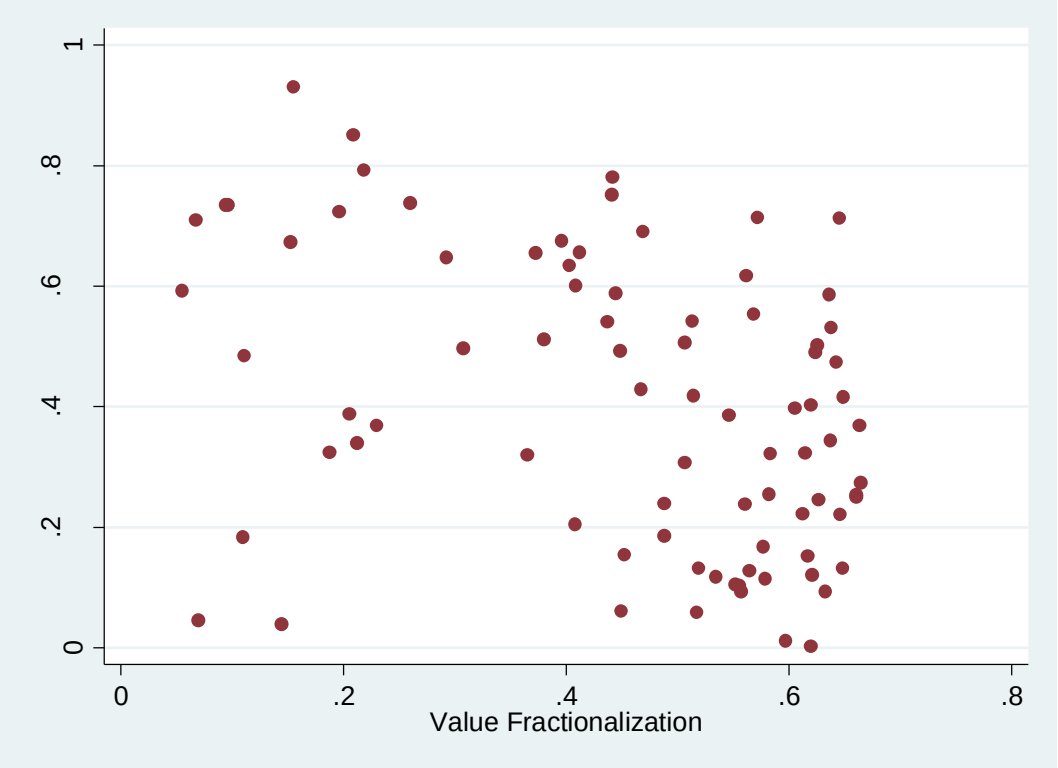


Figure 2. 3 Value Fractionalization index and Ethnic Fractionalization index

Notes: The Vertical Axis Ethnic Fractionalization index; The Horizontal Axis Value Fractionalization index

We observe a negative relationship between ethnic fractionalization and value fractionalization ($r = -0.39$, $p < .01$) [22]. One of the most homogeneous counties with respect to ethnicity is Bangladesh. Ethnic fractionalization index in Bangladesh is 0.05 and value fractionalization is 0.07. One of the most homogeneous countries with respect to ethnicity is also one of the most homogeneous countries with regard to values. Despite a negative link between ethnic fractionalization and value fractionalization, it seems that value fractionalization captures something different from ethnicity.

Figure 2.4 shows the link between value fractionalization and language

[22] See Appendix-table 6 for correlation matrix of value, ethnic, language and religious fractionalization indices.

fractionalization. As seen in the figure, we do not find significant relationship between diversity based on language and human values. This suggests that value fractionalization captures different aspect of peoples' heterogeneity.

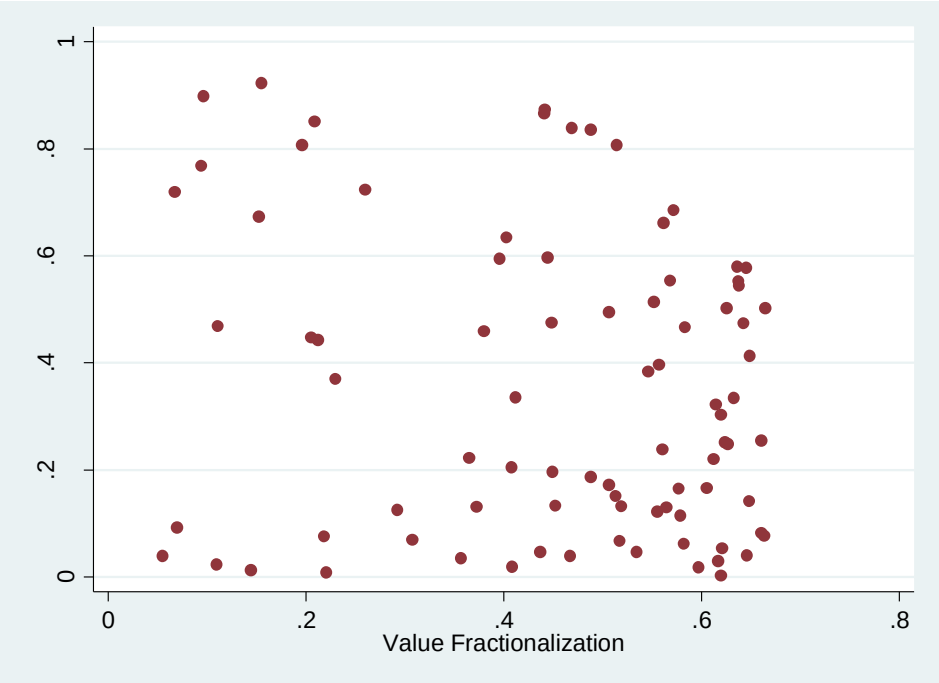


Figure 2. 4 Value Fractionalization index and Language Fractionalization index

Now, we turn to see the relationship between value fractionalization and religious fractionalization. As seen in the figure 2.5, it has a positive relationship between these two measures ($r = 0.29$, $p < .01$) [23].. However, countries that are highly fragmented with respect to religion but highly homogeneous with respect to human values are observed. For instance, value fractionalization index in Ghana is low with 0.15 (mean; 0.45) but, highly fragmented with respect to religion because the religious fractionalization index is 0.80 (mean; 0.45). By contrast, religious fractionalization in Lebanon is 0.79 and it is similar to that of Ghana. However, value fractionalization in

[23] See Appendix-table 6 for correlation matrix of value, ethnic, language and religious fractionalization indices.

Lebanon is 0.52. This also suggests that value fractionalization grasps some different aspects of heterogeneity in a society.

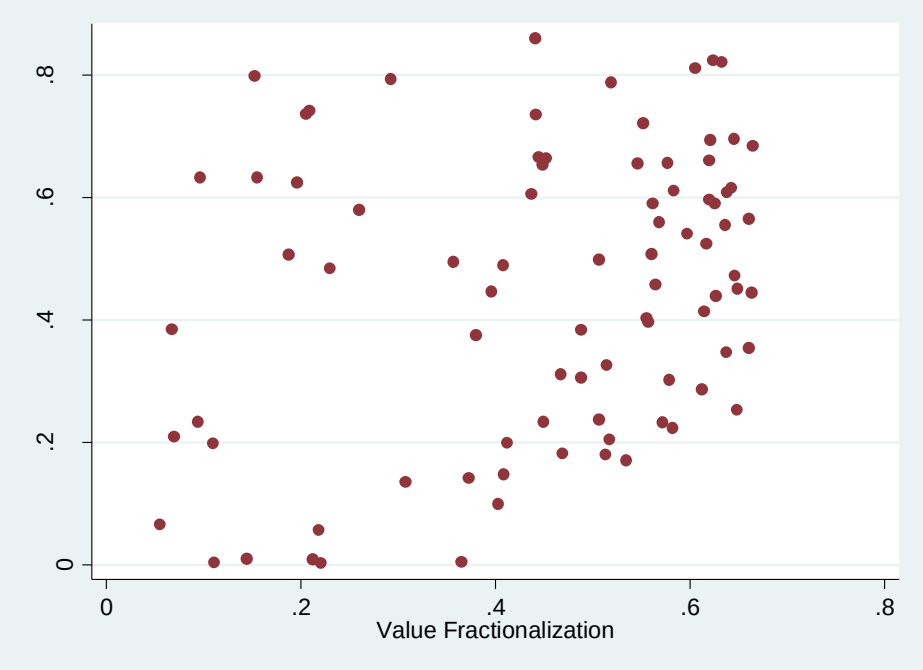


Figure 2. 5 Value Fractionalization index and Religious Fractionalization index

Notes: The Vertical Axis Religious Fractionalization index; The Horizontal Axis Value Fractionalization index

In addition to the above-mentioned countries, two striking examples demonstrate that the value fractionalization captures a new aspect of cultural heterogeneity.

Appedinx-table 2.6 shows value, ethnic, language, and religious fractionalization for each country. Data for ethnic, language, and religious fractionalization is taken from Alesina et al. (2003) and value fractionalization is calculated by aggregating data from wave 3 to wave 6. On one hand, according to Appedinx-table 2.6, Argentina can be considered ethnically homogenous, religiously homogeneous and linguistically homogeneous. Ethnic fractionalization index in Argentina is 0.26 (mean; 0.40), religious fractionalization is 0.22 (mean; 0.45) and language fractionalization is 0.06 (mean; 0.36). However, Argentina is fragmented with respect to

human values because Argentina has high value fractionalization: 0.58 (mean; 0.45). On the other hand, Tanzania is homogeneous with respect to human values (value fractionalization in Tanzania is 0.10 (mean; 0.45)). However, ethnic fractionalization index in Tanzania is 0.74 (mean; 0.40), religious fractionalization is 0.63 (mean; 0.45) and language fractionalization is 0.90 (mean; 0.36). Therefore, Tanzania is homogeneous with regard to human values but heterogeneous from the aspects of ethnicity, religion and language.

Overall, several interesting examples demonstrate that the value fractionalization captures aspect that is different from commonly used cultural fractionalization measures.

2.5.2 Different Number of Groups

This chapter classifies individuals into three groups. Now, it considers whether our diversity measure is robust to defining value fractionalization in alternative ways. In order to investigate whether our measure depends on the definition, we create value fractionalization measures based on 4 groups, 5 groups, …, and 10 groups. More specifically, we classify individuals into more than 3 groups using k-means cluster analysis. After the analysis, each value fractionalization index is calculated using the population shares of the value types in a society. Now, we have 8 different value fractionalization measures. Table 2.6 shows the correlation matrix of value fractionalization measures. As seen in the table, we observe that 8 different value fractionalization indices are highly correlated. This suggests that our value fractionalization measure is robust to changing grouping method.

Table 2. 6 Correlation Matrix of Value Fractionalization indices (Different Number of Groups)

Variables	VF3	VF4	VF5	VF6	VF7	VF8	VF9	VF10
Value frac. (3)	1							
Value frac. (4)	0.94	1						
Value frac. (5)	0.96	0.97	1					
Value frac. (6)	0.97	0.96	0.99	1				
Value frac. (7)	0.98	0.96	0.99	0.99	1			
Value frac. (8)	0.98	0.95	0.98	0.99	0.99	1		
Value frac. (9)	0.98	0.95	0.98	0.98	0.99	0.99	1	
Value frac. (10)	0.96	0.95	0.98	0.98	0.98	0.99	0.99	1

Notes: VF3 is an abbreviation for Value frac. $\text{Value frac.(i)} \equiv 1 - \sum_{i=1}^{n} p_i^2$

2.5.3 Value Diversity from Many Aspects

The approach exploited in this chapter has a number of attractive features. One of the features, unlike traditional measures, is that it enables us to observe cultural diversity for a specific group. In this section, we introduce (1) value fractionalization for people whose farther is immigrant, (2) value fractionalization for people whose mother is immigrant[24], (3) value fractionalization for male and (4) value fractionalization for female.

2.5.3.1 Immigrant

It has been pointed out that people born in a given society have socially determined tendencies to share values that are common in the society. This subsection looks at this using our value fractionalization index.

Hitlin and Piliavan (2004) mention that basic values are relatively stable after formative period. In the case of migration, inherited values and values affected by the new society may conflict. Bardi and Goodwin (2001) refer

[24] We do not use value fractionalization for people whose father and mother is immigrant because of sample size.

that “value adaption” means people tend to accept new values (prevalent values). By value adaption, individuals likely to replace the values close to the ones common in their country of birth with ones common in their new residence[25]. This subsection addresses this value adaption. More specifically, we see whether shares of value types and value fractionalization are similar between people whose parents are immigrant and whose parents are not immigrant. To investigate the relationship between parents’ immigration and value fractionalization index, we see the following two questions from WVS-G026 and G027.

“G 026 Mother Immigrant
Is your mother immigrant to this country or not?”
“G 027 Father Immigrant
Is your father immigrant to this country or not?”

This subsection uses people who answered “Yes” or “No” in each question. Table 2.7 shows the proportion of individuals who are in each value type. First column shows the population share of each value type who answered yes to the question. 58.6 percent of people whose mother is not immigrant are classified as value type 1. As value composition differs across countries, it requires to be very cautious when we interpret these shares. Therefore, this section focuses on value fractionalization. Mean value fractionalization is calculated as follows. First, we calculate value fractionalization for people whose mother is immigrant in a country. Then, we take the average of them. We observe interesting findings here. Table 2.7 shows that individuals whose mother is not immigrant tend to have similar values compared with people whose mother is immigrant. Analogously, People whose father is immigrant tend to have heterogeneous values. This implies that that people (family)

[25] The study of migrants’s values is shown in Berry’s theory of acculturation (Berry, 2011 and Sam and Berry, 2010)

living in a society for a long period tend to share similar thoughts in the society. For instance, we look at Indonesia. Value fractionalization for people whose mother is immigrant is 0.46 in Indonesia. In contrast, value fractionalization for individuals whose mother is not immigrant is 0.12.

As this subsection aims to clarify one of the attractive features of introducing value fractionalization, we would not examine for the role played by characteristics such as immigration status on value types and value fractionalization. This is because it requires cautious discussion to identify key determinant of values. In this stage, this thesis only gives the fact that people living in a society for a long period tend to share similar thoughts in the society. Future research might examine the effect of immigration status on value types and value fractionalization.

Table 2. 7 Mean Value Fractionalization- Mother Immigrant and Father Immigrant

		Value type 1	Value type 2	Value type 3	Mean value frac.	Number of Countries
Mother Immigrant	NO	58.6	17.6	23.8	0.57	63
	YES	45.0	27.3	27.8	0.65	63
Father Immigrant	NO	58.7	17.6	23.8	0.57	63
	YES	44.5	27.8	27.7	0.65	63

Notes: Numbers for each value type is percentage of individuals. Mean value fractionalization index: We first calculate value fractionalization for people whose mother is immigrant in a country. Then, we take the average of them.

2.5.3.2 Gender

One of the largest differences between our cultural diversity measure and widely used cultural diversity measure is that our measure has implications in analyzing cultural diversity by gender. This section focuses on mean value fractionalization for male and female. To create mean value fractionalization

by gender, we calculate value fractionalization for male and female in each country[26]. Then, we take the average of these fractionalization indices.

As seen in table 2.8, female tend to have value type 2 and male tend to have many value type 3 individuals. Value type 2 consists with people who do not show greater respect for authority and people who trust others. In contrast people classified as value type 3 tend to approve homosexuality and show greater national pride. Table 2.8 finds no value fractionalization difference between male and female. In some countries, male is more diverse than female. However, in Sweden, value fractionalization for male is 0.38 and that for female is 0.50. Therefore, compared with female, male tend to share similar values in Sweden. In contrast, value fractionalization for male is 0.51 and that for female is 0.43 in Dominican Republic. It is complex to interpret these differences so that we are not going to scrutiny this table. However, we observed that value fractionalization is not so different between male and female. WVS contains several questions that are interesting to see. For instance, one can create value fractionalization by age. This research will serve as a base for future studies.

Table 2. 8 Mean value Fractionalization by gender

	Value type 1	Value type 2	Value type 3	Mean Value frac.	Number of Countries
Male	55.7	24.6	19.7	0.45	63
Female	55.7	19.0	25.2	0.46	63

Notes: Numbers for each value type is percentage of individuals.

2.6 Concluding Remarks for Chapter 2

Cultural diversity plays an important role in various aspects of society. It has been measured from the aspects of ethnicity, religion and language. However, there has been no discussion about diversity in human values. This

[26] X001 (Sex) from WVS

study sets out to propose an index that considers diversity in human values (value diversity). Value diversity is introduced in order to add new dimension of cultural diversity. There are several advantages of introducing our new measure. One of the merits of our approach is related to group identities. Group identities are complex so that commonly used measure of cultural diversity has problems. Moreover, unlike prevailing measures that captures diversity in external traits, our measure captures diversity in internal traits. In order to find important dimensions for human values, cultural frameworks by Schwartz and by Inglehart are introduced. It is argued that 10 items for Inglehart's approach and 10 items for Schwartz's approach are included in the World Values Survey. Therefore, computation of value diversity indices relies on data from WVS. On the way to create value diversity, we create value type. Individuals who are grouped into the same value type have similar values with respect to 10 items. We first compare two value diversity measures-value fractionalization and value polarization. As we find that value fractionalization and value polarization is closely related, this chapter uses value fractionalization as a value diversity measure. The relationship between value fractionalization and other cultural diversity measures are investigated. Some striking examples show that value fractionalization captures the aspect that is different from traditional measures. Hence, value diversity index is expected to explain several phenomena which have not been grasped by other existing cultural diversity indices. This chapter further investigates the merits of introducing value diversity. As one of the merits this section investigates value diversity from two aspects. Firstly, we see value fractionalization for people whose father (mother) is immigrant. We observe that individuals (family) living in a society for a long period tend to share similar values inside the society. Secondly, this chapter constructs value fractionalization for male and for female. As a whole, the mean value fractionalization is almost the same between male and female. Further studies regarding the role of value diversity and value type in economic

outcomes and social indicators would be worthwhile.

Appendix

Appendix 2.1

Data Description and Sources

Ethnic Fractionalization: Ethnic fractionalization index of each country constructed by Alesina et al. (2003). It captures the probability that two individuals, selected at random from a country's population, will belong to different ethnic groups. Source: Alesina et al. (2003)

Language Fractionalization: Langue fractionalization index of each country constructed by Alesina et al. (2003). It captures the probability that two individuals, selected at random from a country's population, will belong to different language groups. Source: Alesina et al. (2003)

Religious Fractionalization: Religious fractionalization index of each country constructed by Alesina et al. (2003). It captures the probability that two individuals, selected at random from a country's population, will belong to different religious groups. Source: Alesina et al. (2003)

Inglehart items: See Appendix 2.4 for details. Source: the WVS

Schwartz items: A189-A198 Question wording: Now I will briefly describe some people. Using this card, would you please indicate for each description whether that person is very much like you, like you, somewhat like you, not like you, or not at all like you? (Code one answer for each description): Source: the WVS

G 026 (Mother Immigrant): Question Wording "Is your mother immigrant to this country or not?" Answers 0 NO, 1 YES :Source: the WVS

G 027 (Father Immigrant): Question Wording "Is your father immigrant to this country or not?" Answers 0 NO, 1 YES :Source: the WVS

X001(Sex): Question Wording "Sex" Answers 1 Male 2 Female Source: the WVS

Appendix 2.2 (Inglehart) Distribution of the Population of the Countries

Appendix-Table 2. 1 (Inglehart) Distribution of the population of the countries in wave 3 among value types, %

Country	Value type 1	Value type 2	Value type 3
Albania	35.46	26.47	38.07
Azerbaijan	66.67	9.02	24.32
Argentina	47.68	13.77	38.55
Australia	28.05	46.86	25.10
Armenia	42.97	30.08	26.95
Bulgaria	18.94	56.38	24.68
Belarus	35.53	47.22	17.25
Chile	71.95	5.32	22.74
Croatia	29.75	37.59	32.65
Dominican Rep.	67.11	4.61	28.29
Estonia	16.10	70.73	13.17
Finland	27.77	39.83	32.40
Georgia	59.16	18.81	22.03
Germany	12.79	59.49	27.71
Hungary	25.38	53.01	21.62
India	74.18	14.61	11.22
Latvia	26.22	47.57	26.22
Lithuania	48.48	35.20	16.32
Mexico	64.29	12.43	23.28
Moldova	55.79	25.31	18.89
New Zealand	22.97	50.70	26.33
Nigeria	89.73	2.70	7.57
Norway	16.75	60.99	22.27
Peru	68.48	5.34	26.18
Philippines	70.61	2.17	27.22
Puerto Rico	79.04	2.07	18.90
Romania	46.40	18.69	34.91
Russia	30.96	53.64	15.40
Slovakia	27.05	35.52	37.42
Slovenia	27.14	51.22	21.64
South Africa	75.58	3.64	20.78
Spain	33.22	27.25	39.52
Sweden	4.58	71.04	24.38
Switzerland	19.61	38.64	41.75
Ukraine	37.80	45.54	16.67

Macedonia	34.99	45.11	19.90
United States	54.03	13.72	32.25
Uruguay	43.92	28.89	27.19
Venezuela	80.94	5.17	13.89
Serbia	28.04	53.89	18.07
Montenegro	45.26	38.69	16.06
Bosnia	56.09	21.29	22.61
Country	Value type 1	Value type 2	Value type 3

Notes: People classified as Value type 1 tend to abstain from petition and disapprove abortion. Individuals who do not show greater respect for authority and who trust others are classified as Value type 2. Individuals in Value type 3 tend to approve homosexuality and show greater national pride.

Appendix-Table 2. 2 (Inglehart) Distribution of the population of the countries in wave 4 among value types, %

Country	Value type 1	Value type 2	Value type 3
Albania	54.72	24.65	20.63
Algeria	93.17	1.68	5.15
Argentina	58.20	10.73	31.06
Bangladesh	96.42	2.55	1.04
Bosnia	55.56	24.02	20.42
Canada	30.73	24.97	44.30
Chile	65.95	6.48	27.57
India	57.28	8.68	34.04
Indonesia	98.38	0.29	1.33
Israel	35.97	20.13	43.90
Japan	18.43	54.12	27.45
Jordan	97.89	0.00	2.11
South Korea	38.35	46.52	15.13
Kyrgyzstan	70.41	17.45	12.14
Mexico	61.99	3.62	34.39
Moldova	51.21	24.72	24.07
Nigeria	92.83	1.33	5.84
Pakistan	98.75	0.00	1.25
Peru	82.43	3.65	13.92
Philippines	61.42	2.43	36.14
Puerto Rico	74.84	1.42	23.73
Singapore	61.50	21.75	16.75

Viet Nam	49.34	45.26	5.39
South Africa	64.43	6.71	28.86
Zimbabwe	95.70	2.21	2.10
Spain	22.14	41.88	35.99
Sweden	5.16	66.92	27.92
Uganda	91.62	1.35	7.03
Macedonia	57.42	23.25	19.33
Egypt	94.21	0.59	5.20
Tanzania	94.97	2.83	2.20
United States	41.00	12.62	46.37
Venezuela	82.68	1.99	15.32
Serbia	39.45	41.95	18.60
Montenegro	52.63	28.95	18.42
Country	Value type 1	Value type 2	Value type 3

Notes: People classified as Value type 1 tend to abstain from petition and disapprove abortion. Individuals who do not show greater respect for authority and who trust others are classified as Value type 2. Individuals in Value type 3 tend to approve homosexuality and show greater national pride.

Appendix-Table 2. 3 (Inglehart) Distribution of the population of the countries in wave 5 among value types, %

Country	Value type 1	Value type 2	Value type 3
Andorra	8.48	42.52	49.00
Argentina	45.57	11.71	42.71
Australia	20.65	41.15	38.19
Brazil	61.78	1.73	36.49
Bulgaria	21.64	44.96	33.40
Canada	29.17	25.39	45.44
Chile	50.43	9.62	39.95
China	31.01	66.20	2.79
Taiwan	39.67	34.85	25.48
Colombia	70.74	1.39	27.87
Cyprus	50.46	7.99	41.56
Ethiopia	89.28	2.74	7.98
Finland	17.37	39.84	42.79
France	11.63	58.48	29.89
Georgia	89.79	1.47	8.74

Country	Value type 1	Value type 2	Value type 3
Germany	12.97	60.55	26.48
Ghana	87.83	0.30	11.87
Guatemala	74.95	0.94	24.11
Hungary	26.45	50.53	23.02
India	55.46	22.61	21.93
Indonesia	93.46	1.78	4.76
Italy	54.85	13.07	32.08
Japan	17.02	53.19	29.79
Jordan	99.02	0.36	0.63
South Korea	38.19	44.79	17.02
Malaysia	61.32	11.20	27.48
Mali	65.46	2.64	31.90
Mexico	52.05	3.58	44.37
Moldova	67.12	11.45	21.42
Netherlands	12.76	56.38	30.86
New Zealand	18.67	55.50	25.83
Norway	4.90	66.95	28.14
Poland	63.82	7.96	28.22
Romania	70.97	4.59	24.45
Russia	43.23	37.65	19.12
Rwanda	92.21	1.85	5.94
Viet Nam	43.21	49.15	7.64
Slovenia	17.95	48.63	33.42
Spain	16.79	46.46	36.75
Sweden	2.42	68.52	29.06
Thailand	73.80	3.60	22.59
Trinidad and Tobago	79.02	2.24	18.74
Turkey	82.88	2.74	14.39
Ukraine	48.22	21.15	30.63
Great Britain	20.21	49.87	29.92
United States	39.88	15.32	44.81
Burkina Faso	85.05	2.08	12.88
Uruguay	29.14	22.11	48.76
Serbia and Montenegro	30.34	18.45	51.21
Zambia	69.36	2.99	27.65

Notes: People classified as Value type 1 tend to abstain from petition and disapprove abortion. Individuals who do not show greater respect for authority and who trust others are classified as Value type 2. Individuals in Value type 3 tend to approve homosexuality and show greater national pride.

Appendix-Table 2. 4 (Inglehart) Distribution of the population of the countries in wave 6 among value types, %

Country	Value type 1	Value type 2	Value type 3
Algeria	80.17	1.17	18.67
Azerbaijan	85.32	0.94	13.73
Australia	13.25	53.07	33.67
Armenia	87.10	6.80	6.10
Chile	42.61	9.23	48.15
China	23.17	71.01	5.81
Taiwan	30.04	35.80	34.17
Colombia	75.50	2.08	22.42
Cyprus	53.39	5.86	40.76
Ecuador	76.58	3.37	20.05
Estonia	18.68	63.44	17.89
Palestine	91.29	0.53	8.18
Germany	17.59	49.49	32.92
Ghana	95.10	0.26	4.65
Iraq	86.80	0.20	13.00
Japan	16.16	57.11	26.73
Kazakhstan	59.29	16.04	24.67
Jordan	94.67	1.05	4.28
South Korea	34.32	48.52	17.16
Kyrgyzstan	79.76	8.44	11.80
Lebanon	62.95	9.57	27.48
Libya	87.70	1.30	11.00
Malaysia	79.80	4.13	16.07
Mexico	58.87	4.25	36.88
Morocco	94.14	0.75	5.11
Netherlands	9.37	59.34	31.30
New Zealand	15.30	53.88	30.82
Nigeria	85.84	1.48	12.68
Pakistan	93.54	1.40	5.06
Peru	65.36	5.30	29.34
Philippines	54.70	2.99	42.31
Poland	59.59	14.76	25.66
Romania	70.76	6.75	22.49
Russia	43.18	28.06	28.76
Rwanda	87.84	9.73	2.43
Slovenia	14.02	55.67	30.31
Zimbabwe	84.39	1.01	14.60
Spain	13.10	53.56	33.33
Sweden	3.04	72.51	24.45
Trinidad and Tobago	86.65	1.64	11.71
Tunisia	92.21	0.44	7.34

Country	Value type 1	Value type 2	Value type 3
Turkey	86.74	1.66	11.60
Ukraine	51.54	20.98	27.47
United States	32.28	21.07	46.65
Uruguay	27.50	31.91	40.59
Yemen	87.55	1.29	11.16

Notes: People classified as Value type 1 tend to abstain from petition and disapprove abortion. Individuals who do not show greater respect for authority and who trust others are classified as Value type 2. Individuals in Value type 3 tend to approve homosexuality and show greater national pride.

Appendix 2.3 Value, Ethnic, Language, and Religious Fractionalization

Appendix-Table 2. 5 Value, Ethnic, Language, and Religious fractionalization

Country	Value Frac.	Ethnic Frac.	Lnaguage Frac.	Religious Frac.
Albania	0.65	0.22	0.04	0.47
Algeria	0.21	0.34	0.44	0.01
Andorra	0.57	0.71	0.68	0.23
Azerbaijan	0.41	0.20	0.21	0.49
Argentina	0.58	0.26	0.06	0.22
Australia	0.63	0.09	0.33	0.82
Bangladesh	0.07	0.05	0.09	0.21
Armenia	0.56	0.13	0.13	0.46
Brazil	0.44	0.54	0.05	0.61
Bulgaria	0.62	0.40	0.30	0.60
Belarus	0.58	0.32	0.47	0.61
Canada	0.65	0.71	0.58	0.70
Chile	0.49	0.19	0.19	0.38
China	0.45	0.15	0.13	0.66
Taiwan	0.66	0.27	0.50	0.68
Colombia	0.41	0.60	0.02	0.15
Croatia	0.66	0.37	0.08	0.44
Cyprus	0.56	0.09	0.40	0.40
Dominican Rep.	0.47	0.43	0.04	0.31
Ecuador	0.37	0.66	0.13	0.14
Ethiopia	0.20	0.72	0.81	0.62
Estonia	0.51	0.51	0.49	0.50
Finland	0.65	0.13	0.14	0.25
France	0.56	0.10	0.12	0.40
Georgia	0.45	0.49	0.47	0.65
Germany	0.58	0.17	0.16	0.66
Ghana	0.15	0.67	0.67	0.80
Guatemala	0.38	0.51	0.46	0.38
Hungary	0.62	0.15	0.03	0.52
India	0.51	0.42	0.81	0.33
Indonesia	0.09	0.74	0.77	0.23
Iraq	0.23	0.37	0.37	0.48
Israel	0.64	0.34	0.55	0.35
Italy	0.58	0.11	0.11	0.30
Japan	0.60	0.01	0.02	0.54
Kazakhstan	0.56	0.62	0.66	0.59
Jordan	0.06	0.59	0.04	0.07
South Korea	0.62	0.00	0.00	0.66
Kyrgyzstan	0.40	0.68	0.59	0.45
Lebanon	0.52	0.13	0.13	0.79
Latvia	0.64	0.59	0.58	0.56
Libya	0.22	0.79	0.08	0.06
Lithuania	0.61	0.32	0.32	0.41
Malaysia	0.44	0.59	0.60	0.67

Mali	0.47	0.69	0.84	0.18
Mexico	0.51	0.54	0.15	0.18
Moldova	0.57	0.55	0.55	0.56
Morocco	0.11	0.48	0.47	0.00
Netherlands	0.55	0.11	0.51	0.72
New Zealand	0.61	0.40	0.17	0.81
Nigeria	0.21	0.85	0.85	0.74
Norway	0.52	0.06	0.07	0.20
Pakistan	0.07	0.71	0.72	0.38
Peru	0.41	0.66	0.34	0.20
Philippines	0.49	0.24	0.84	0.31
Poland	0.53	0.12	0.05	0.17
Puerto Rico	0.36		0.04	0.50
Romania	0.51	0.31	0.17	0.24
Russia	0.63	0.25	0.25	0.44
Rwanda	0.19	0.32		0.51
Singapore	0.55	0.39	0.38	0.66
Slovakia	0.66	0.25	0.26	0.57
Viet Nam	0.56	0.24	0.24	0.51
Slovenia	0.61	0.22	0.22	0.29
South Africa	0.44	0.75	0.87	0.86
Zimbabwe	0.21	0.39	0.45	0.74
Spain	0.65	0.42	0.41	0.45
Sweden	0.45	0.06	0.20	0.23
Switzerland	0.64	0.53	0.54	0.61
Thailand	0.40	0.63	0.63	0.10
Trinidad and Tobago	0.29	0.65	0.13	0.79
Tunisia	0.14	0.04	0.01	0.01
Turkey	0.36	0.32	0.22	0.00
Uganda	0.16	0.93	0.92	0.63
Ukraine	0.64	0.47	0.47	0.62
Macedonia	0.63	0.50	0.50	0.59
Egypt	0.11	0.18	0.02	0.20
Great Britain	0.62	0.12	0.05	0.69
Tanzania	0.10	0.74	0.90	0.63
United States	0.62	0.49	0.25	0.82
Burkina Faso	0.26	0.74	0.72	0.58
Uruguay	0.66	0.25	0.08	0.35
Venezuela	0.31	0.50	0.07	0.14
Yemen	0.22		0.01	0.00
Zambia	0.44	0.78	0.87	0.74
Country	Value Frac.	Ethnic Frac.	Lnaguage Frac.	Religious Frac.

Notes: Value frac; Abbreviation of value fractionalization index, Ethnic frac; Abbreviation of ethnic fractionalization index; Source Alesina et al. (2003)Langue frac; Abbreviation of language fractionalization index; Source Alesina et al. (2003) Religious frac; Abbreviation of religious fractionalization index; Source Alesina et al. (2003)

Appendix 2.4 Ten Items from Cultural Framework by Inglehart

Ten Items for Inglehart's Dimensions

Source: World Values Surveys Wave 3 (1995-1998), Wave4 (1999-2004), Wave 5 (2005-2009) and Wave 6 (2010-2014).

Importance of God :

Question wording: "How important is God in your life? Please use this scale to indicate where 10 means very important and 1 means not at all important." Individual-level data is used and it takes discrete number from 1 to 10. Larger numbers indicate a higher degree of importance.

Teach Children Obedience and Faith rather than Independence and Determination (Autonomy index) :

Question wording: "Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five."

The list of qualities we used contains the following; "obedience," "religious faith," "independence," and "determination, perseverance."

We coded each of the above-mentioned qualities 1 if chosen and 0 if not chosen. Then we calculated the following index:

$$\begin{aligned}\text{Autonomy index} &= \text{Obedience} + \text{Religious faith} - \text{Independence} \\ &\quad - \text{Determination, Preseverance}\end{aligned}$$

This index is called autonomy index (Inglehart and Baker, 2000). The index ranges from –2 to +2. Thus, an individual who chose both independence and determination but neither obedience nor religious faith has score -2. On the other hand, it scores +2 if an individual chose both obedience and religious faith but neither independence nor determination.

Disapproval of Abortion :

Question wording: “Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between, using this card.”

The card provides discrete numbers from 1 to 10. 1 means “never justifiable” and 10 means “always justifiable.” Statement is “abortion.” Thus, this number shows the degree of approval of abortion and it provides discrete numbers from 1 to 10 with larger numbers indicating a higher degree of approval. We reversed this scale so that larger numbers indicate a higher degree of disapproval of abortion.

National Pride :

Question wording: “How proud are you to be [nationality]?”

It is required to answer the question from the following options. 1 “very proud”, 2 “quite proud”, 3 “not very proud”, and 4 “not at all proud.”

This paper reversed this scale. Therefore, larger numbers indicate a stronger degree of national pride.

Respect for Authority :

Question wording: “I'm going to read out a list of various changes in our way of life that might take place in the near future. Please tell me for each one, if it were to happen, whether you think it would be a good thing, a bad thing, or don't you mind?”

The list we use is “greater respect for authority.” We coded individuals 1 if they showed greater respect for authority to be a good thing and 0 otherwise.

Priority for Economic and Physical Security (Materialist Values) :

Question wording:

The first question is “People sometimes talk about what the aims of this country should be for the next ten years. On this card are listed some of the goals which different people would give top priority. Would you please say

which one of these you, yourself, consider the most important?" and the next question is: "And which would be the next most important?"
The options include the followings: "Maintaining order in the nation," "giving people more say in important government decisions," "fighting rising prices" and "protecting freedom of speech."
We coded each of "maintaining order in the nation" and "fighting rising prices" 1 if chosen in first or second choice and 0 if not chosen. We added them and calculate so-called Materialist values which ranges from 0 to 2 (Inglehart and Baker, 2000). An individual who chose both "maintaining order in the nation" and "fighting rising prices" has score 2 which means strong priority for materialistic goals.

Feeling of Unhappiness:
Question wording: "Taking all things together, would you say you are: 1 Very happy, 2 quite happy, 3 not very happy, 4 not at all happy."
It measures the degree of unhappiness. Larger numbers indicate a higher degree of unhappiness.

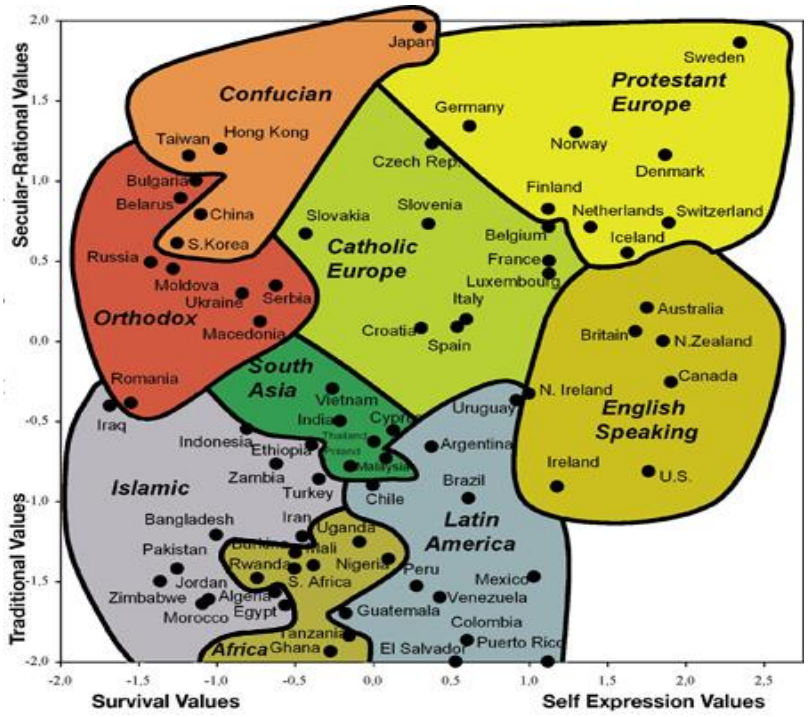
Disapproval of Homosexuality :
Question wording: "Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between, using this card."
The card provides discrete numbers from 1 to 10. 1 means "never justifiable" and 10 means "always justifiable Statement is "homosexuality." Therefore, it indicates the degree of acceptance of homosexuality. We reversed this scale so that larger numbers indicate a higher degree of disapproval of homosexuality.

Abstaining from Signing Petitions:

Question wording: “Now I'd like you to look at this card. I'm going to read out some different forms of political action that people can take, and I'd like you to tell me, for each one, whether you have actually done any of these things, whether you might do it or would never, under any circumstances, do it.”
Individuals who answered “have done” or “might do” are coded 0. Other individuals are coded 1. Hence, 1 indicates abstaining from signing petitions.

Distrusting in Other People:
Question wording: “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?: 1 Most people can be trusted, 2 need to be very careful.”
Individuals are coded 1 if they answered “need to be very careful” and 0 otherwise. Thus, this measure indicates how people distrusting in other people.

Appendix 2.5 Map of Countries (Inglehart)



Appendix-Figure 2. 1 Map of Countries (Wave 5, 2008)

Source: Inglehart and Welzel (2010), "Changing Mass Priorities: The Link Between Modernization and Democracy." Perspectives on Politics (vol. 8, No. 2) page 554.

Appendix-Table 2. 6 Correlation matrix of value, ethnic, language and religious fractionalization indices

	1	2	3	4
1 Value fractioinalization	1			
2 Ethnic fractionalization	-0.39*	1		
3 Language fractionalization	-0.19	0.65*	1	
4 Religious fractionalization	0.29*	0.10	0.30	1

NOTES: *<.05

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Chapter Three:

Institutions and Economic Performance: Revisiting the Relationship

Chapter Overview

Despite the seminal article Acemoglu, Johnson and Robinson (AJR) (2001) and several recent papers, there is still little consensus on the role of institutions in economic development given that endogeneity concerns and use of appropriate instruments still plague the causal relationship. We revisit the existing theory, challenge the instrumental variables used, and seek alternative ways of investigating the impact of institutions on economic performance. Using a new measure of cultural diversity that we proposed in chapter 2 as instrument, we improve upon previous studies in showing that the quality of institution plays an important role in economic development, providing robust empirical underpinnings to AJR theoretical hypothesis.

A seminal article, Acemoglu, Johnson and Robinson (2001), henceforth AJR (2001), investigates the causal effect of institutions, measured by protection against the risk of expropriation, on economic performance across previously colonized countries. They argue that colonization strategy was affected by the feasibility of settlement and this strategy determined the quality of institutions. Exploiting the variations in European settler mortality rates as an instrument they show that quality of institutions cause economic development. The central idea of AJR (2001) has been adopted to many other papers (Rodrik et al., 2004; Tabellini, 2010; Acemoglu et al., 2014). On the other hand, validity of using settler mortality rates as instruments for institutions has been widely debated (AJR, 2001; AJR, 2012; Acemoglu et al., 2014; Albouy, 2012; Glaeser et al., 2004; Michalopoulos and Papaioannou, 2014). For instance, Albouy (2012) points out that it is not appropriate to use the AJR (2001) mortality series in the analysis because of data problems. However, AJR (2012) shows that the results in AJR (2001) are robust using an alternative instrument called capped potential settler mortality[27]. This debate largely stems from the quality of historical data and given the limited data sources currently available, instruments based on historical data remain a key concern. Hence, to overcome the measurement issues with historical data, we exploit the existing diversity in human values across and within countries to disentangle the effect of current institutions on economic performance. The results presented using a new and robust measure of cultural diversity provide the vital empirical basis to the AJR theoretical hypothesis.

Our plan is first to revisit the basic theory constructed by the existing studies and then to seek alternative ways of investigating the impact of institutions on economic performance. Using the widely used World Values Survey (WVS) we construct the novel measure of cultural diversity – index of value fractionalization

[27] Settler mortality capped at 250 per 1000 per annum is used to reduce the impact of high mortality outliers. AJR (2012) argues that capping extreme values is a widely used strategy for dealing with outliers and potentially contaminated data.

to reflect the diversity in human values within a country. Exploiting the cross-country variation in this index as an instrument for the quality of institutions we estimate the impact of institutions on economic performance.

Our theory is based on two grounds. Firstly, we hypothesize that value fractionalization affects institutional quality.[28] Our intuition is that in the countries that are highly fragmented with regard to human values it is more difficult to agree on the form of the institutions and by necessity these institutions are rather more complicated.[29] Secondly, we demonstrate that value fractionalization has no direct impact on economic performance[30].

In practice it is often difficult to find convincing instruments. Our second theory is mainly supported by the followings. There is no evidence that value fractionalization impacts economic performance directly. Further, many studies examine the role of institutions on economic performance using cultural diversity measure as instruments for the quality of institutions. Finally, unlike observable heterogeneity in a society (e.g. heterogeneity in ethnicity, language), it is difficult for people to grasp value fractionalization in a country so that it is natural to assume that people do not take hidden heterogeneity into account when they make economic decision.

Our approach draws from Mauro (1995) and other articles that estimates the impact of institutions on economic performance using more conventional cultural diversity measure as instruments for the quality of institutions in IV estimation.[31]

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[28] It does not mean institutional quality is determined only by diversity in peoples' values, but value fractionalization seems to be one of the factors that have an impact on current institutional quality.

[29] For instance, in some countries like Lebanon that have a lot of ethnic and religious division complicated mechanisms exist to counterbalance representation of various groups in the power. In a similar way any significant diversity within a country in human values may also require more complicated institutions. A need for more complicated institutions puts more constraints on the government and thus may affect institutional quality.

[30] Section 4.4.3 for results.

[31] Ethno-linguistic fractionalization is used as an instrument in Mauro (1995). This approach has been adopted by many other articles. For instance, Méon and Sekkat

However we differ from these studies by focusing directly on “internal traits” such as belief and human values in comparison to previously used “external traits” such as ethnicity and language.[32]

Here we first perform OLS and regress GDP per capita on institutions (rule of law index from World Bank). We find a strong link between economic performance and institutions. Then, institutions are instrumented using value fractionalization. By IV regressions, we observe the strong impact of institutions on economic performance.

One of the objectives of this chapter is to develop a new approach that allows us to check the robustness of the results on the role of institutions in economic performance derived by AJR (2001) and Acemoglu et al. (2014). An improvement in the robustness is attained with the use of value fractionalization as instruments for institutions instead of settler mortality. There are several further advantages to our approach. The use of value fractionalization (i) enables us to overcome concerns about the quality of historical data and mitigates the risk of reverse causality that settler mortality affects current economic performance not only through institutional development but also thorough past economic performance and (ii) improves the robustness of the results by including countries that have been less affected by Europeans. Although many researchers have empirically shown that colonial experience plays an important role in institutions, it is difficult to explain the variation in current economic performance among countries that had never been colonized by the Europeans. Since our premises are not based on colonial policy we are able to investigate the role of institutions in economic

(2008) estimate the impact of institutions (e.g. the rule of law index) on economic performance (e.g. exports of manufactured goods) using ethno-linguistic fractionalization as an instrument for institutions. Further, the relationship between institutional quality and exports is examined by Faruq (2011). IV estimation is adopted and ethno-linguistic fractionalization is used as an instrument for institutional quality.

[32] Religion is not a perfect measure of internal traits either. Vast majority of people our days stay in the religion they were born to.

performance for countries that are not so much influenced by European countries. Results presented show a significant impact of institutions on economic performance not only for ex-colonies but also for countries less affected by the Europeans.

In order to evaluate the robustness of our approach, we first add several widely used control variables and show that our results are robust to the inclusion of these variables. We then investigate the validity of our approach using value fractionalization as an exogenous variable in AJR (2001) model. The results suggest that value fractionalization has no direct impact on GDP per capita and this supports our approach. Moreover, estimation using panel dataset also supports our main findings. Finally, this chapter constructs value fractionalization measures based on different definitions and concludes that our results do not change a lot by using these value fractionalization measures. Overall, our estimates indicate that an improvement in institutional quality leads to economic development.

The remainder of this chapter is organized as follows. Section 3.1 examines the existing theory. Section 3.2 describes the definition of value fractionalization. In section 3.3, we present our main results. Section 3.4 investigates the robustness of our main results and section 3.5 summarizes this study and provides concluding remarks.

3.1. Examining the Existing Theory

A considerable amount of literature has been published on the impact of institutions on economic performance. AJR (2001) investigates the causal effect of institutions and argues that, during the colonial era, Europeans were more likely to settle in regions where the risk of getting disease was lower. In colonies where Europeans settled, they established efficient institutions with better protection

of property rights in comparison to colonies with no large settlement. Hence, where the Europeans settled, they created better institutions with respect to protection of property rights than in colonies where they did not settle.

In order to examine the relationship between institutions and economic performance, AJR (2001) uses an instrumental-variables approach for countries that were ex-colonies. A potential European settler mortality rates is used as an instrument for the protection against expropriation risk. According to AJR (2001), the reason for using the instrument is that the European settler mortality rates more than 100 years ago have no direct impact on current GDP per capita. However, it has the indirect effect on current GDP per capita through development of institutions.

Basic theory used in AJR (2001, 2012) and Acemoglu et al. (2014) is that Europeans determined whether they settle or not by (potential) settler mortality rates and their settlement in the colonies was a key determinant of early institutions. After the creation of early institutions, they have persisted and affect the feature of current institutions. This relationship has been applied to many other articles (Rodrik et al. 2004; Tabellini, 2010; AJR, 2012; Acemoglu et al. 2014) and it is summarized using relationships (1) and (2) in Figure 3.1.

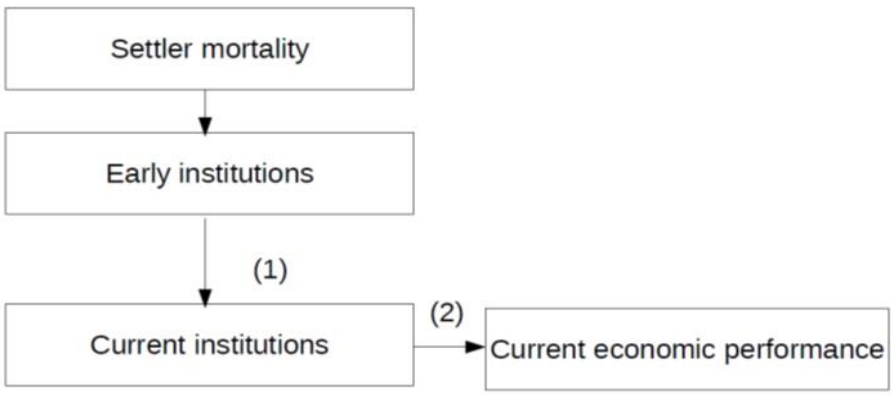

Figure 3. 1 Early institutions, current institutions and current economic performance

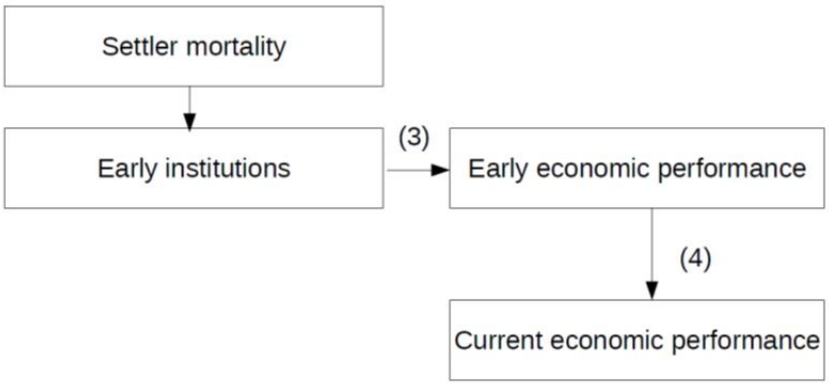

Figure 3. 2 Early institutions, early economic performance and current economic performance

It is however not unlikely that early institutions affect early economic performance (relationship 3 in Figure 3.2) which in turn may have consequence for current economic performance (relationship 4 in Figure 3.2). A number of papers found the causal relationship between institutions and economic performance (AJR, 2001; Mauro, 1995; Hall and Jones, 1999; Acemoglu et al., 2014). They show that efficient institutions cause economic development so that it is natural to assume that this relationship is also true in the past (relationship 3 in Figure 3.2). We now empirically examine if the relationships are true using an index constraint on executive in 1900 to represent early institutions[33]. Figure 3.3 presents simple plots of early institutions and early economic performance for a sample of 15 countries (Data Source: AJR (2001) and The Maddison-Project). We find a significant positive correlation between log of GDP per capita in 1900 and constraint on executive in 1900 (r = 0.68, p <0.01).

[33] Constraints faced by the executive in 1900 is used to represent early institutions in AJR (2001). A higher score indicating more constraints.

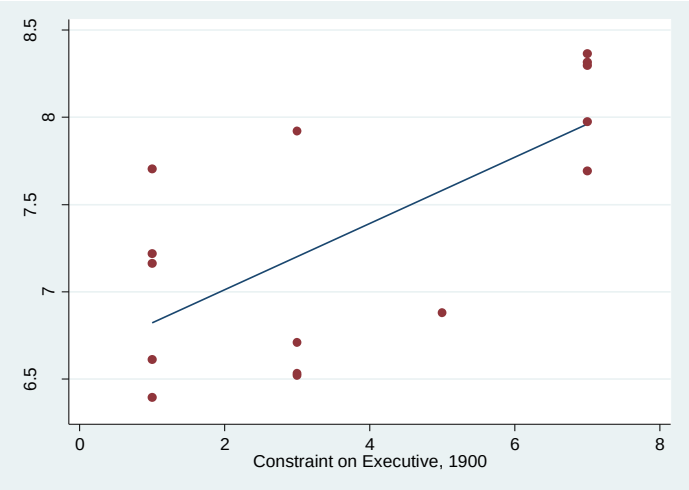

Figure 3. 3 The relationship between early institutions and early economic performance (relationship 3)

Notes: The Vertical Axis Log GDP per capita in 1900; The Horizontal Axis Constraint on Executive in 1900. Linear prediction is shown in the figure.

Next in Figure 3.4 we plot the relationship between the log of settler mortality and the log of GDP per capita in 1900 for a sample of 18 countries. There is a significant negative correlation between log of settler mortality and log of GDP per capita in 1900 (r = -0.76, p < 0.01) showing that there is a significant correlation between the instrument used in AJR (2001) and early economic performance. Both Figure 3.3 and Figure 3.4 together suggest that relationship (3) in Figure 3.2 is indeed true.

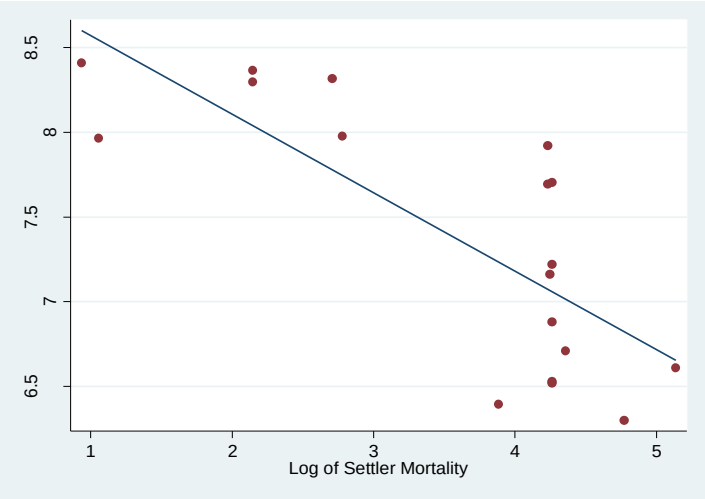

Figure 3. 4 The relationship between early economic performance and settler mortality

Notes: The Vertical Axis Log GDP per capita in 1900; The Horizontal Axis log settler mortality. Linear prediction is shown in the figure.

We now turn to see the relationship between early economic performance and current economic performance (relationship 4 in Figure 3.2). Figure 3.5 plots the log of GDP per capita in 2000 against the log of GDP per capita in 1900 in the whole world sample (Data Source: The Maddison-Project). There is a significant positive correlation between log of GDP per capita in 2000 and log of GDP per capita in 1900 (r = 0.81, p < 0.01). Similar relationship is found for a sample of ex-colonies (Appendix-Figure 3.1, r = 0.87, p < 0.01). These figures indicate that early economic performance tended to persist and relationship 4 in Figure 3.2 seems to be true. Given that settler mortality rate seems to affect current economic performance via channels other than current institutions, the use of settler mortality rate as an instrument is somewhat unconvincing.

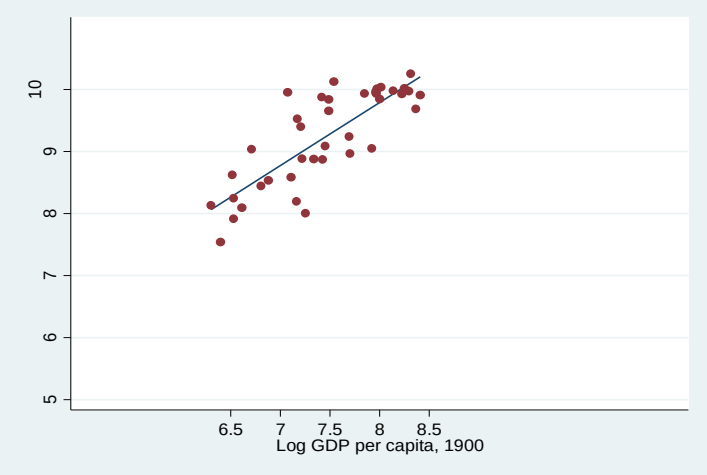

Figure 3. 5 The relationship between early economic performance and current economic performance

Notes: The Vertical Axis Log GDP per capita in 2000; The Horizontal Axis Log GDP per capita in 1900. Linear prediction is shown in the figure.

Though many papers following AJR (2001) and use historical variables as instruments for institutions, our observations indicate that using historical variables as instruments for current institutions may lead to misleading conclusions because historical variables may affect past economic performance via past institutions[34].

3.2 Value Fractionalization: Cultural Diversity based on Human Values

As discussed in previous section, this chapter aims to find alternative instruments for institutions that are not historical variables to revisit the relationship between institutions and economic performance. As a candidate for

[34] Hall and Jones (1999) propose latitude as an instrument for Western influence. But Western influence also seems to affect current economic performance thorough channels other than current institutions.

instrument for institutions, the chapter proposes “value fractionalization” that captures diversity of human values within a country. In this section, we discuss and define value fractionalization.

Value fractionalization enables us to address some shortcomings of previous studies. Firstly, value fractionalization captures a new aspect of cultural diversity. A considerable amount of literature has been published on the role of cultural diversity in economic performance (Alesina and La Ferrara, 2002). However, previous studies on cultural diversity mainly focus on diversity of ethnicity, religion and language that are rather “external traits”. There has been little discussion on the impact of diversity of human values and accounting for it can be beneficial.

Secondly, the introduction of value fractionalization may solve some problems of using ethnicity, religion and language as a measure of cultural diversity. The absence of a uniform criterion to define ethnicity is problematic (Fish and Brooks, 2004). Moreover, for instance, a person who can speak more than one language fluently finds it difficult to identify her native language. Further, some people have more than one religion. According to the CIA World Fact Book, 83.9 percent of Japanese are classified as Shintoism, 71.4 percent as Buddhism, 2 percent as Christianity, and 7.8 percent as others. Total exceeds 100 percent because many Japanese belong to both Shintoism and Buddhism (CIA Fact Book). This is problematic because standard cultural diversity measure assumes that the total is 100 percent. By contrast, in order to calculate value fractionalization, all individuals are divided into groups that share similar thoughts so that the total is always 100 percent.

The use of value fractionalization instead of historical variables also has its problems, but it avoids criticism applied to previous literature. Therefore, our approach plays a complementary role. In addition to this role, it enables us to examine the impact of institutions not only for ex-colonies but also for countries

that are less affected by European countries[35]. Further, it also allows us to address diversity in internal traits which is interesting in its own.

Following the literature on cultural diversity (e.g. Alesina and La Ferrara, 2005; Easterly and Levine, 1997; Fearon, 2003), our value fractionalization index measures the probability that two randomly selected individuals in a society are from different cultural groups and it is calculated as follows:

$$Fractionalization \equiv 1 - \sum_{i=1}^{n} p_i^2$$

Where the population shares of the cultural groups in a society are denoted as $p_1,\ p_2,\ ..\ ,\ p_n$ and n, is the number of cultural groups.

This index takes values from 0 to 1 and it is maximized when every individual in a society belongs to different cultural group.

World Values Survey (WVS) is then used to construct cultural groups based on values. The way of creating value fractionalization index is the same as chapter 2. Firstly, we select some survey questions which are important dimensions of human values. Secondly, individuals who made similar responses are classified into the same group. We call this group "value type". Finally, we derive value fractionalization index from the population shares of the value types in a country. In order to find important questions from WVS, this chapter follows Inglehart's approach to human values. Ten items[36] that Inglehart and Baker (2000) and Inglehart and Welzel (2005) used are shown in Appendix 3.1.

We use the third round to the sixth round of WVS data, which were collected in 1994–2014: Wave 3 (1994-1998), Wave 4 (1999-2004), Wave 5 (2005-2009) and Wave 6 (2010-2014). The reason why we excluded Wave 1 and Wave 2 is that these waves are weighted with advanced economies. We used data from 90 cultural groups. The sample sizes differ between cultural groups. In contrast to ethnicity,

[35] This chapter does not use colonial policy so that we can examine the role of institutions in economic performance for non-excolonies.
[36] Survey questions are shown in Appendix and ten Items for Inglehart's Dimensions are summarize in table 2.2

language, and religion there are no pre-determined groupings for human values. This chapter also uses k-means cluster analysis in order to classify respondents into three groups[37]. By this grouping method, individuals in the same group (value type) share common characteristics[38]. Cluster analysis tells us the population shares of the value types in a society so that we can calculate value fractionalization index. Value fractionalization is maximized when every individual in a society belongs to different value type. Hence, individuals in a society with low value fractionalization score tend to share common values[39].

As previously mentioned, value fractionalization can be a key determinant of institutional quality. Figure 3.6 shows the relationship between value fractionalization and the rule of law index in 2010 for 35 countries that are included in both WVS and AJR (2001). A positive and linear relationship is found in the figure (r = 0.64, p < 0.01)[40]. Rodrik et al. (2004) and Acemoglu et al (2014) argue that the rule of law index has positive impact on economic performance. These facts and our assumption that value fractionalization has effect on institutions, but does not have a direct impact on economic performance suggest that value fractionalization can be a candidate for an instrument for institutions.

Finally, Figure 3.7 shows the positive relationship between the rule of law index in 2010 and log GDP per capita in 2010. We examine this relationship in the next section.

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[37] In section 3.4.4, we consider whether our main results are robust to grouping individuals into 4-10 groups.

[38] Individuals classified as value type 1, compared with other value types, tend to abstain from petition and disapprove abortion. Many individuals in Jordan and Libya are classified as value type 1. Value type 2 mainly consists with people who do not show greater respect for authority and people who trust others compared with other value types. The respondents in Sweden and Norway tend to have this value type. Individuals classified as value type 3 have a tendency to approve homosexuality and show greater national pride. USA and Canada have many value type3 individuals.

[39] Appendix-Table 3.1 shows the countries with high value fractionalization index and low value fractionalization index.

[40] This will be our first stage for our main two stage least squares estimates.

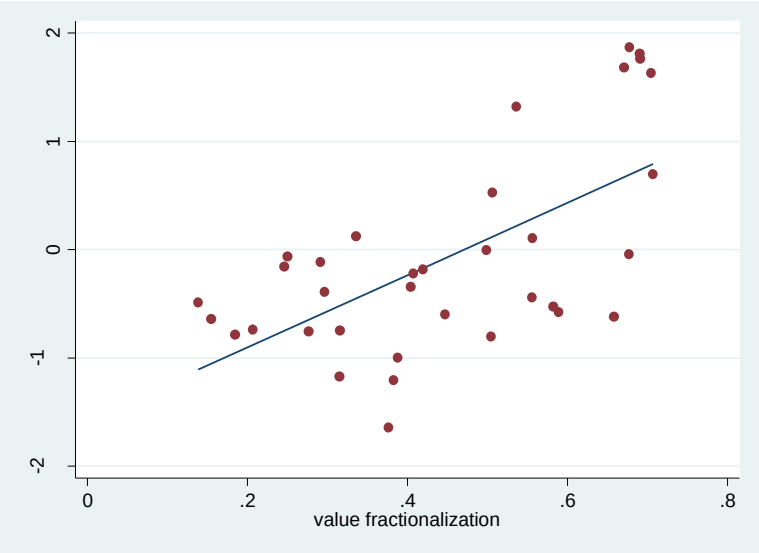


Figure 3. 6 Value fractionalization and the rule of law index in 2010 (35 countries that are included in both WVS and AJR, 2001)

Notes: Linear prediction is shown in the figure.

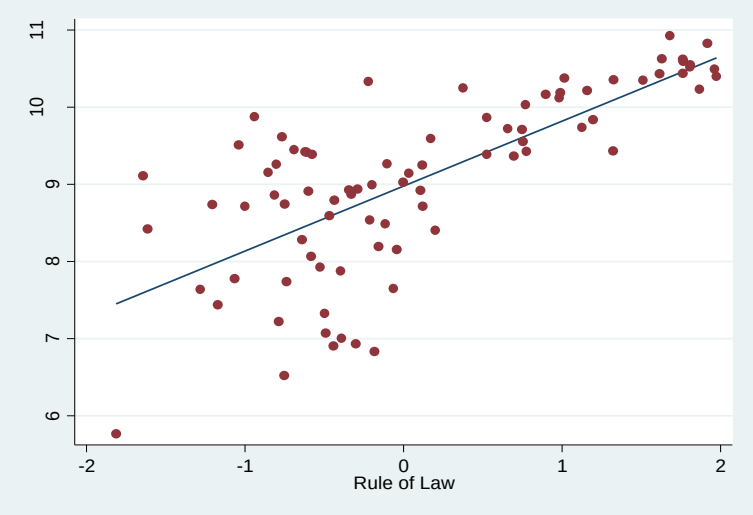


Figure 3. 7 The relationship between the rule of law index in 2010 and log GDP per capita in 2010 (Full sample)

Notes: The Vertical Axis Log GDP per capita in 2010; The Horizontal Axis Rule of law index. Linear prediction is shown in the figure.

3.3 Institutions and Performance

3.3.1 Data and Descriptive Statistics

Our main measure of institutions is the rule of law index for 2010 from the Worldwide Governance Indicators (WGI) constructed by the World Bank. This measure is used in Rodrik et al. (2004) and Acemoglu et al. (2014). According to Rodrick et al. (2004), the advantage of using the rule of law as an index of institutional quality is that it is available for many countries, and this index "captures more elements that go toward determining institutional quality." Further, Acemoglu et al. (2014) use the rule of law index because this measure provides "the most up-to date measure of broad institutions." "The rule of law index captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence (Kaufmann et al. 2013)". This measure ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance.

Table 3.1 provides descriptive statistics for the key variables. The first column is for the full sample included in WVS. 35 countries are common in both WVS (waves 3 to 6) data and AJR (2001) data. Thus, we call this sample "base sample" [41]. The third column is for the countries that were ex-colonies. Ex-colony is a sample of 40 countries that were ex-colonies. Libya, Philippines, Rwanda, Zimbabwe, and Zambia are included in Ex-colonies and not included in base sample. GDP per capita in 2010 is our measure of current economic performance as reported in Penn World table. In our base sample of 35 countries, the richest

[41] We use base sample because this chapter first revisits the relationship between institutions and economic performance shown in AJR (2001).

country is Singapore and the poorest country is Ethiopia. The mean log GDP per capita in the full sample is 9.08 and that in base sample is 8.71. In our base sample of 35 countries, the mean score of the rule of law is -0.08. Zimbabwe (score of -1.81) has the weakest institutions and New Zealand (score of 1.86) has the strongest institutions.

Table 3. 1 Descriptive Statistics

	Full sample (84 countries)	Base sample (35 countries)	Ex-colonies (40 countries)
log GDP per capita in 2010	9.08	8.71	8.57
	(1.16)	(1.19)	(1.27)
Rule of Law	0.12	-0.08	-0.17
	(1.00)	(0.94)	(0.93)
Latitude	0.35	0.21	0.21
	(0.19)	(0.15)	(0.15)
value fractionalization	0.45	0.36	0.44
	(0.18)	(0.19)	(0.17)

Notes: There are three samples: (1) Full sample, (2) base sample (sample of 35 countries included in both WVS waves 3-6 and AJR 2001), (3) 40 countries that are Ex-colonies. Standard deviations are reported below the means. GDP per capita in 2010 Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of law ranges between -2.5 (weak) to 2.5 (strong) governance performance; Value fractionalization ranges from 0 and 0.67 and is minimized when every individual in a society shares similar human values. Appendix 3.1describes the data and its sources.

3.3.2 Ordinary Least-Squares Regressions

Table 3.2 reports ordinary least-squares (OLS) regressions of log GDP per capita on the rule of law index in variety of samples. The estimation is done for five groups of countries: (1) for the full 84 countries that are available in WVS and

Penn World table (2) for the countries that were colonized[42] (3) for the sample of 35 countries that are included in both WVS and AJR (2001) (4) for the base sample of 27 countries without Africa[43] and (5) for the full sample without Europe[44].

Column (1) shows the strong relationship between the rule of law and log GDP per capita in the full sample. In column (2), latitude is included as an independent variable following AJR (2001) and Acemoglu et al. (2014). The OLS estimate of the impact of institutions on log of GDP per capita is 0.84[45] without control variables and 0.71 with latitude. In columns (7) and (8), this study shows that our results are robust to dropping African countries from our base sample. Inclusion of latitude decreases the coefficient of institutions for the full sample, base sample, ex-colonies and the full sample without Europe. However, it increases the coefficient of the rule of law index if we limit the sample to base sample without Africa. Further, the coefficient of latitude is insignificant in columns (4), (6), (8), and (10).

One of the differences between our models and models in AJR (2001) and Acemoglu et al. (2014) is that our theory enables us to see the effect of institutions for the countries that are less affected by European countries. Table 3.2 indicates that the relationship between institutional quality and economic performance is similar in ex-colonies and the countries that are less influenced by Europe.

Overall, the results in Table 3.2 show a close relationship between institutional quality measured by the rule of law index and economic performance. However, as argued in AJR (2001) and many other papers, there are several reasons for not interpreting this relationship as causal and accurate. This is mainly because of

[42] Ex-colony is used to extend AJR sample.
[43] By following AJR (2001), we also use base sample without Africa.
[44] We only have 9 countries that had never been colonized and non-European countries. Therefore, we use the full sample without Europe to see the impact of institutions for countries that are less affected by Europe.
[45] Table 2 of Acemoglu et al. (2014) reports OLS regressions of log GDP per capita in 2005 on the rule of law index using a sample of 62 countries that are former colonies. They also find a significant relationship with a coefficient of 0.93.

reverse causality, omitted variables bias and measurement error. In order to solve these problems, AJR (2001), Rodrik et al. (2004), and Acemoglu et al. (2014) use an instrumental-variables approach. By following these studies, the instrumental-variables approach is employed in our chapter to demonstrate that the relationship shown in this section is not a simple correlation but a causal relationship. In the next subsections, this chapter exploits an IV approach and argues that value fractionalization is a plausible instrument for institutions.

Table 3. 2 OLS Regressions of log GDP per capita

	Full sample		Ex-colonies		Base sample		Base sample without Africa		Full sample without Europe	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Dependent variable is log GDP per capita in 2010									
Rule of Law	0.84***	0.71***	0.86***	0.78***	0.81***	0.76***	0.66***	0.74***	0.88***	0.78***
	(0.09)	(0.10)	(0.17)	(0.19)	(0.17)	(0.20)	(0.13)	(0.15)	(0.14)	(0.15)
Latitude		1.48***		1.10		0.66		-1.13		1.52
		(0.49)		(1.22)		(1.21)		(0.94)		(1.00)
R-squared	0.53	0.58	0.40	0.41	0.41	0.41	0.51	0.53	0.44	0.47
Number of observation	84	84	40	40	35	35	27	27	51	51

Notes: OLS regressions with one observation per country. Dependent variable is log GDP per capita in 2010 Source: Penn World Table; Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; There are five samples: (1) full sample, (2) 40 countries that are Ex-colonies, (3) base sample (sample of 35 countries included in both WVS waves 3-6 and AJR 2001), (4) Base sample without Africa, and (5) full sample without Europe. Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of Law (in 2010) ranges between -2.5 (weak) to 2.5 (strong) governance performance. See Appendix 3.1 for more details.

3.3.3 IV Results

In table 3.3, we report models in which the rule of law index is treated as endogenous. The exclusion restriction for our instrumental variables regression is that value fractionalization has no direct impact on log GDP per capita, other than its effect through the rule of law index. Panel A of table 3.3 shows the two-stage least squares estimates using value fractionalization as an instrument for the rule of law index. Panel B of the table reports the first stage relationship between institutions and our instrument value fractionalization. To see whether our instrument suffers from the presence of weak instrument, we check the F-statistics for the first stage regressions and find that the F-statistics for the first stage regressions exceed 10 (as proposed by Staiger and Stock 1997).

In Column (1), the impact of institutions on log of GDP per capita is 1.47. This is highly significant and larger than that of the OLS estimates reported in table 3.2 (0.84). 2SLS results in AJR (2001) and Acemoglu et al. (2014) also show that the coefficient on institutions is larger than that of OLS estimate. In all models, we observe that the coefficients for the rule of law index in the IV estimations are larger than that in the corresponding OLS estimations.

Latitude is added in the second column and this does not change the link between the rule of law index and log GDP per capita. However, the coefficient on institutions increases from 1.47 to 1.64. The coefficient on latitude is negative and insignificant. This is also seen in columns (2), (4), (6), (10) and AJR (2001). Columns (7) and (8) show that our results are robust to dropping Africa from base sample. The coefficient of institutions is smaller without Africa and this is also observed in AJR (2001). Columns (9) and (10) report that the impact of institutions on economic performance does not change for the countries that are less influenced by European culture. This suggests that value fractionalization enables us to estimate the impact of institutional quality on economic development not

only for ex-colonies but also for countries that are less affected by European countries. In addition, columns (1) and (2) imply that value fractionalization can be used as an instrument for institutions not only for ex-colonies but also for the full sample.

As a whole, table 3.3 shows that institutions have positive impact on economic performance and value fractionalization seems to be a plausible instrument for institutions. The next section argues the robustness of the results obtained in this section.

Table 3. 3 IV Regressions of log GDP per capita

	Full sample		Ex-colonies		Base sample		Base sample without Africa		Full sample without Europe	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Two-Stage Least Squares: Dependent variable is log GDP per capita in 2010										
Rule of Law	1.47***	1.64***	1.48***	1.59***	1.50***	1.72***	1.11***	1.25***	1.49***	1.54***
	(0.21)	(0.40)	(0.35)	(0.46)	(0.36)	(0.51)	(0.27)	(0.31)	(0.28)	(0.36)
Latitude		-0.78		-1.20		-2.25		-2.66**		-0.56
		(1.16)		(1.82)		(2.03)		(1.34)		(1.46)
Panel B: First Stage for Rule of Law										
value fractionalization	2.83***	2.02***	2.79***	2.30***	2.75***	2.20***	2.96***	2.58***	2.85***	2.43***
	(0.51)	(0.61)	(0.67)	(0.67)	(0.69)	(0.69)	(0.86)	(0.81)	(0.57)	(0.59)
Latitude		1.32**		1.91**		2.08**		2.39**		1.63*
		(0.58)		(0.85)		(0.87)		(1.00)		(0.78)
R-Squared	0.27	0.31	0.32	0.40	0.32	0.43	0.32	0.45	0.34	0.39
F statistics	30.41	10.86	17.51	11.78	15.75	10.14	11.76	10.24	24.94	17.00
Number of observations	84	84	40	40	35	35	27	27	51	51

Notes: Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable is log GDP per capita Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of law ranges between -2.5 (weak) to 2.5 (strong) governance performance value fractionalization ranges from 0 and 0.67 and is minimized when every individual in a society shares similar human values. Panel A reports the two stage-least squares estimates with log GDP per capita in 2010 as the dependent variable and Rule of Law is instrumented using value fractionalization. Panel B reports the corresponding first stage. See Appendix 3.1 for more details.

3.4. Robustness

3.4.1 Robustness Checks for Omitted Variables

Table 3.4 shows the robustness of the results in table 3.3. In keeping with AJR (2001), we add dummies for British and French colonies. In columns (1) (2), (5) and (6), British and French colonial dummies are included[46] but these dummies have little effect on our main results. AJR (2001) finds that, in their first stage for average protection against expropriation risk, French colonial dummy is not significant but British colonial dummy is significant and positive. We also find that French colonial dummy is insignificant and British colonial dummy is positive and significant in our first stage for the rule of law index. This suggests that British colonies tend to have better institutions.

As discussed in La porta et al. (1999), legal origin plays an important role in institutions and hence economic performance. We add French legal origin dummy in columns (3), (4), (7) and (8). We find that the impact of institutions on economic performance increases a little. In AJR (2001), the effect of institutions on GDP per capita is unchanged after controlling for French legal origin. However, the finding that French legal origin is closely related to worse institutions (AJR, 2001) is also found in the first stage for the rule of law index.

The inclusion of dummies for French legal origin tends to increase the estimated coefficient on institutions. However, the impact of institutions on log GDP per capita is still highly significant. Inclusion of latitude increases the coefficient of the rule of law index. Further, inclusion of colonial dummies and legal origin dummies tends to increase the estimated coefficient on institutional quality, but its significance level is not influenced by them.

In all cases, the results are similar to those in table 4 and the coefficient of the

[46] The omitted group is the others

rule of law is always significantly different from zero. In summary, the results from 2SLS models, in which the rule of law index is instrumented using value fractionalization instead of historical variables, show a robust effect of current institutions on current economic performance[47].

Table 3. 4 Two stage least squares for extended controls

	Base sample				Ex-colonies			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Two-Stage Least Squares: Dependent variable is log GDP per capita in 2010								
Rule of Law	1.46***	1.58***	1.56***	1.79***	1.46***	1.47***	1.54***	1.65***
	(0.33)	(0.44)	(0.36)	(0.51)	(0.32)	(0.41)	(0.35)	(0.46)
Latitude		-1.12		-2.27		-0.10		-1.14
		(1.71)		(1.94)		(1.59)		(1.74)
British colonial dummy	-0.90*	-0.90*			-0.89**	-0.89**		
	(0.47)	(0.49)			(0.42)	(0.42)		
French colonial dummy	-0.69	-0.60			-0.66	-0.65		
	(0.47)	(0.51)			(0.47)	(0.49)		
French legal origin			0.84*	0.96*			0.83**	0.87**
			(0.44)	(0.51)			(0.40)	(0.43)
Panel B: First Stage for Rule of Law								
value fractionalization	2.76***	2.29***	2.62***	2.09***	2.78***	2.36***	2.68***	2.22***
	(0.61)	(0.63)	(0.64)	(0.63)	(0.62)	(0.65)	(0.64)	(0.64)
Latitude		1.62*		1.99**		1.52*		1.81**
		(0.82)		(0.80)		(0.86)		(0.82)
British colonial dummy	0.88***	0.74***			0.70***	0.58**		
	(0.26)	(0.26)			(0.25)	(0.25)		
French colonial dummy	-0.69	0.06			0.22	0.06		
	(0.47)	(0.32)			(0.33)	(0.33)		
French legal origin			-0.64**	-0.61**			-0.50**	-0.47**
			(0.25)	(0.23)			(0.24)	(0.23)
R-Squared	0.51	0.57	0.44	0.54	0.44	0.48	0.39	0.46
F statistics	20.41	13.17	16.67	10.98	19.83	13.12	17.47	11.92
Number of observations	35	35	35	35	40	40	40	40

Notes: Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; GDP per capita Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of Law ranges between -2.5 (weak) to 2.5 (strong) governance performance; Value fractionalization ranges from 0 and 0.67 and is minimized when every individual in a society shares similar

[47] A robust effect of institutions on economic development is also reported for countries that are less affected by Europe (the full sample without Europe) and for the full sample. See Appendix-table 3.2.

human values. See Appendix 3.1 for more details. Panel A reports the two stage-least squares estimates with log GDP per capita in 2010 as the dependent variable and Rule of law is instrumented using value fractionalization. Panel B reports the corresponding first stage.

3.4.2 The Exclusion Restriction

We can test the validity of our approach using AJR (2001) model. In columns (1) and (2) of table 3.5, we follow AJR (2001) and use the log of settler mortality (capped at a maximum level of 250, as in Acemoglu et al. 2014) as an instrument for institutions. Then, we include value fractionalization as an exogenous variable. In column (1), the coefficient of value fractionalization is 1.00 (with standard error 1.37) and value fractionalization has a coefficient of 0.89 (with standard error 1.50) in column (2). Therefore, in AJR (2001) model, we find that the coefficient on value fractionalization is statistically insignificant. This shows that value fractionalization has no direct impact on economic performance. Hall and Jones (1999) and Rodrik et al. (2004) use fraction of the population speaking English and fraction of the population speaking other European languages as instruments for institutions in IV estimation. In columns (3)-(6), we use the proportion of population speaking English as an instrument for the rule of law index. The estimation is done for base sample in columns (3) and (4), and for ex-colonies in columns (5) and (6). Again, in all cases, value fractionalization is included as an exogenous variable. As seen in columns (3)-(6), we find that the coefficient of value fractionalization is statistically insignificant. Overall, table 6 shows that the effect of value fractionalization on economic performance seems to work through the impact of institutional quality. This supports that value fractionalization is a valid instrument.

Given that there is no evidence that value fractionalization impacts economic performance directly, we follow other studies that used various cultural diversity

measures as instrument for the quality of institutions in IV estimation (see footnote 27 for details)

Table 3. 5 Second Stage with Value fractionalization as Exogenous Variable

	Base sample				Ex-colonies	
	(1)	(2)	(3)	(4)	(5)	(6)
Two-Stage Least Squares: Dependent Variable is log GDP per capita in 2010 Second Stage with Value Fractionalization as Exogenous Variable						
Instrument	log capped potential settler mortality		Population Speaking English			
Rule of Law	1.14***	1.32**	1.09***	1.23**	1.12***	1.17**
	(0.40)	(0.54)	(0.38)	(0.49)	(0.39)	(0.48)
value fractionalization	1.00	0.89	1.13	1.08	1.00	0.97
	(1.37)	(1.50)	(1.32)	(1.41)	(1.38)	(1.43)
Latitude		-1.40		-1.23		-0.40
		(1.62)		(1.53)		(1.47)
Number of observations	35	35	35	35	40	40

Notes: Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; GDP per capita Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of Law ranges between -2.5 (weak) to 2.5 (strong) governance performance; Value fractionalization ranges from 0 and 0.67 and is minimized when every individual in a society shares similar human values. See Appendix 3.1 for more details. This table reports results from the regression in which value fractionalization is included as an exogenous variable and Rule of law is instrumented using alternative instruments. In columns (1) and (2), Rule of law is instrumented using log capped settler mortality. Source: Acemoglu et al. (2014). Columns (3)-(6) use the proportion of population speaking English as instrument for Rule of law. Source: Hall and Jones (1999).

3.4.3 A Panel Dataset

In this section, we run pooled OLS on various specifications using data from four waves of the World Values Survey. We take each country/wave average as an

observation[48]. Therefore, we calculate value fractionalization for each wave. Our panel data is unbalanced because some countries have data for only one wave while others have several waves. Further, instead of using country fixed effects we use latitude as an independent variable. In Columns (1) and (2) of table 3.6, we report results from pooled OLS for the full sample. Columns (3) and (4) report pooled OLS for ex-colonies. The results are very similar to table 3.3. In the last four columns, institutions are instrumented using value fractionalization. We find that the coefficients for the rule of law in the IV estimations are larger than that in the corresponding OLS estimations and value fractionalization can be used as an instrument for institutions not only for ex-colonies but also for the full sample. The results presented here fully support our main findings.

Table 3. 6 Results using a panel dataset

	Full sample		Ex-colonies		Full sample		Ex-colonies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent Variable is log GDP per capita							
	Pooled OLS				IV			
Rule of Law	0.91***	0.78***	0.93***	0.84***	1.29***	1.14*	1.28***	1.39***
	(0.04)	(0.047)	(0.09)	(0.10)	(0.28)	(0.62)	(0.18)	(0.28)
Latitude		1.40***		1.14*		0.49		-0.98
		(0.24)		(0.60)		(1.43)		(1.33)
Number of observations	336	336	160	160	164	164	78	78

Notes: Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; GDP per capita Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of Law ranges between -2.5 (weak) to 2.5 (strong) governance performance; Value fractionalization ranges from 0 and 0.67 and is minimized when every individual in a society shares similar human values. See Appendix 3.1 for more details. In columns (5) -(8), Rule of law is instrumented using value fractionalization. Wave 3 was conducted over years 1994-1998, wave 4 over years 1999-2004, wave 5 over years 2005-2009, and wave 6 over years 2010-2014.

[48] This way is drawn from Dearmon and Grier (2009). WVS is used and each country/wave average is taken as an observation.

3.4.4 Value Fractionalization: Different Number of Groups

This study classifies individuals into three groups. However, one can reason that classifying individuals into a different number of groups is possible. In this section, we consider whether our main results are robust to defining value fractionalization in alternative ways. Using 10 items from Inglehart and Welzel (2005), this section uses k-means cluster analysis to classify individuals into 3-10 groups. Hence, we obtain 8 different value fractionalization indices. As a result, our main findings are proved to be robust to these changes of value fractionalization definition. For instance, let us consider value fractionalization based on 8 value types. Table 3.7 shows IV regressions of log GDP per capita using value fractionalization based on 8 value types as an instrument for the rule of law index. As shown in the table, we obtain similar results compared with table 3.3. Further, table 3.8 shows IV regressions using 5 different value fractionalization indices. In Columns (1) and (2), value fractionalization based on 4 groups is used as an instrument for institutions. Further, columns (3) and (4) use value fractionalization based on 5 value types. As seen in the table, all the 5 value fractionalization indices seem to be valid instruments for institutions. In conclusion, the use of value fractionalization based on different definitions (different number of groups) has only little impact on our main results.

Table 3. 7 IV regressions of log GDP per capita (value fractionalization based on 8 value types)

	Full sample		Ex-colonies		Base sample		Base sample without Africa		Full sample without Europe	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Panel A: Two-Stage Least Squares: Dependent variable is log GDP per capita in 2010									
Rule of Law	1.46***	1.60***	1.52***	1.63***	1.59***	1.84***	1.15***	1.28***	1.53***	1.58***
	(0.20)	(0.36)	(0.35)	(0.46)	(0.38)	(0.55)	(0.28)	(0.32)	(0.29)	(0.36)
Latitude		-0.69		-1.32		-2.62		-2.74**		-0.67
		(1.06)		(1.84)		(2.18)		(1.37)		(1.48)
	Panel B: First Stage for Rule of Law									
value frac. (8 groups)	2.68***	2.00***	2.44***	2.03***	2.37***	1.88***	2.65***	2.34***	2.55***	2.18***
	(0.46)	(0.55)	(0.59)	(0.58)	(0.62)	(0.61)	(0.80)	(0.73)	(0.51)	(0.52)
Latitude		1.23**		1.98**		2.14**		2.48**		1.73**
		(0.57)		(0.84)		(0.87)		(0.99)		(0.77)
R-Squared	0.29	0.33	0.31	0.40	0.31	0.42	0.307	0.45	0.33	0.40
F statistics	34.17	13.38	17.25	12.12	14.61	9.47	11.07	10.21	24.58	17.56
Number of observations	84	84	40	40	35	35	27	27	51	51

Notes: Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable is log GDP per capita Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of law ranges between -2.5 (weak) to 2.5 (strong) governance performance value fractionalization is minimized when every individual in a society shares similar human values. Panel A reports the two stage-least squares estimates with log GDP per capita in 2010 as the dependent variable and Rule of Law is instrumented using value fractionalization based on 8 value types. Panel B reports the corresponding first stage. See Appendix 3.1 for more details.

Table 3. 8 IV regressions of log GDP per capita using different definition of value fractionalization

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: Two stage least squares :Dependent variable is log GDP per capita in 2010											
number of groups	4		5		6		7		9		10	
RuleofLaw	1.47***	1.68***	1.54***	1.77***	1.46***	1.60***	1.49***	1.66***	1.48***	1.64***	1.47***	1.64***
	(0.24)	(0.52)	(0.24)	(0.47)	(0.21)	(0.36)	(0.21)	(0.39)	(0.21)	(0.40)	(0.23)	(0.44)
Latitude		-0.87		-1.08		-0.67		-0.83		-0.78		-0.78
		(1.41)		(1.32)		(1.06)		(1.14)		(1.14)		(1.24)
	Panel B: First stage for Rule of Law											
corresponding value fractionalization	2.77***	1.74**	2.66***	1.80***	2.82***	2.08***	2.69***	1.94***	2.55***	1.83***	2.48***	1.67***
	(0.57)	(0.69)	(0.53)	(0.60)	(0.49)	(0.57)	(0.48)	(0.56)	(0.46)	(0.55)	(0.49)	(0.57)
Latitude		1.53**		1.55***		1.32**		1.35**		1.31**		1.51***
		(0.60)		(0.56)		(0.56)		(0.56)		(0.57)		(0.57)
R-Squared	0.22	0.28	0.23	0.30	0.28	0.33	0.27	0.32	0.27	0.32	0.24	0.07
F-statistics	23.35	6.45	24.90	8.99	32.57	13.11	31.05	12.03	30.91	11.29	25.38	8.71
number of observations	84	84	84	84	84	84	84	84	84	84	84	84

Notes: Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable is log GDP per capita Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of law ranges between -2.5 (weak) to 2.5 (strong) governance performance value fractionalization ranges from 0 and 0.67 and is minimized when every individual in a society shares similar human values. Panel A reports the two stage-least squares estimates with log GDP per capita in 2010 as the dependent variable and Rule of Law is instrumented using value fractionalization. Panel B reports the corresponding first stage. Columns (1) and (2) use 4 value types. In columns (3) and (4), 5 value types are used. 6 value types are used in columns (5) and (6), whereas 7 value types are exploited in columns (7) and (8). Value fractionalization based on 9 groups is used in columns (9) and (10). Finally, value fractionalization based on 10 value types is used as an instrument in (11) and (12). See Appendix 3.1 for more details.

3.4.5 Additional Results

In order ensure that a few countries are not driving the main results, we re-estimate the models with some countries excluded from our sample. We first see

that our main results are not driven by highly fragmented (homogeneous) countries with respect to human values. We do not report here but our results are robust to excluding the most homogeneous country Jordan (value fractionalization 0.06). Exclusion of three homogeneous countries, Jordan, Pakistan (value fractionalization 0.07) and Bangladesh (value fractionalization 0.09), does not change our main results. Further, Croatia (value fractionalization 0.66) is the most diverse country with respect to human values in our Full sample. Therefore, we exclude Croatia and estimate the impact of Rule of law on economic performance. Again, we find a significant effect of Rule of law on economic performance. In addition, exclusion of three diverse countries (Croatia, Uruguay and Slovakia) does not affect our results.

In addition, it is widely argued that rich countries may prefer efficient institutions. To alleviate concerns of reverse causation, we also use the Average rule of law for each country instead of the rule of law in 2010. As seen in Appendix-table 3.3. The coefficient estimates for average rule of law are very similar to the coefficients estimates for the rule of law index in 2010 in Table 3.3 and are statistically different from zero. This table indicates that institutions cause economic development and value fractionalization can be used as an instrument for institutions. The use of average institutional quality instead of current institutional quality has only little impact on our estimation.

Further, we replace rule of law index with the average of six categories for the quality of institutions-Rule of Law, Control of Corruption, Government Effectiveness, Political stability and Absence of Voice / Terrorism, Regulatory Quality, Voice and accountability[49]. In conclusion, our main results survived. Therefore, the use of the average six categories does not affect our main findings and value fractionalization can be used as an instrument for the quality of institutions.

[49] See Appendix 3.1 for details

Finally, in order to correct for heteroscedasticity, robust standard errors are used in all regressions in table 3.9. It reports the results using cluster robust standard error and finds that our main findings do not change a lot.

Table 3. 9 IV Regressions of log GDP per capita

	Full sample		Ex-colonies		Base sample		Base sample without Africa		Full sample without Europe	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Two-Stage Least Squares: Dependent variable is log GDP per capita in 2010										
Rule of Law	1.47***	1.64***	1.48***	1.59***	1.50***	1.72***	1.11***	1.25***	1.49***	1.54***
	(0.20)	(0.33)	(0.27)	(0.33)	(0.28)	(0.36)	(0.23)	(0.23)	(0.23)	(0.27)
Latitude		-0.78		-1.20		-2.25*		-2.66***		-0.56
		(1.01)		(1.28)		(1.37)		(1.03)		(1.25)
Panel B: First Stage for Rule of Law										
value fractionalization	2.83***	2.02***	2.79***	2.30***	2.75***	2.20***	2.96***	2.58***	2.85***	2.43***
	(0.46)	(0.58)	(0.69)	(0.68)	(0.68)	(0.68)	(0.76)	(0.70)	(0.57)	(0.59)
Latitude		1.32**		1.91**		2.08**		2.39**		1.63*
		(0.66)		(0.90)		(0.92)		(1.04)		(0.87)
R-Squared	0.27	0.31	0.32	0.40	0.32	0.43	0.32	0.45	0.34	0.39
F statistics	38.51	12.09	16.30	11.33	16.48	10.28	15.17	13.78	25.06	16.71
Number of observations	84	84	40	40	35	35	27	27	51	51

Notes: robust Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable is log GDP per capita Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of law ranges between -2.5 (weak) to 2.5 (strong) governance performance value fractionalization ranges from 0 and 0.67 and is minimized when every individual in a society shares similar human values. Panel A reports the two stage-least squares estimates with log GDP per capita in 2010 as the dependent variable and Rule of Law is instrumented using value fractionalization. Panel B reports the corresponding first stage. See Appendix 3.1 for more details.

3.5 Concluding Remarks for Chapter 3

In this study, we revisit the relationship between institutions and economic performance. The aim of this chapter is to check the robustness of results obtained by AJR (2001, 2012) supported by other recent papers such as Acemoglu et al. (2014). We follow their approach in general but challenge the use of historical data as an instrumental variable and propose instead a novel measure of value fractionalization reflecting the diversity in values. Our main results still resonate with the existing studies establishing that institutional quality affects economic performance. The IV estimates of institutional quality's impact on GDP per capita are larger than the OLS estimates and significantly different from zero. We further report that our results are not driven by African countries and are robust to controlling for latitude.

Importantly, there are two advantages of using value fractionalization as an instrument for institutions. Firstly, the use of value fractionalization makes it possible to mitigate some concerns in previous literature: poor quality of historical dataset and the link that historical variables may affect current economic performance not only through institutional development but also through past economic performance. The second advantage is the sample that includes ex-colonies and also countries less affected by the Europeans. Unlike previous studies that use premises based on colonial policy, our premises are independent of colonial policy. Therefore, the use of value fractionalization as an instrument for institutions enables us to investigate the impact of institutions not only for ex-colonies but also for countries that are less affected by European countries.

Appendix

Appendix 3.1 Data

DATA DESCRIPTION AND SOURCES

GDP per capita (only section 3.1): Source: The Maddison-Project available at http://www.ggdc.net/maddison/maddison-project/home.htm

GDP per capita (section 2 to section 4): Source: Penn World Table

Latitude: Absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999)

Constraint on executive in1900: It ranges from 1 to 7 and the higher score indicates more constraints. Score 1 indicates unlimited authority; 3 indicates slight to moderate limitations; 5 indicates substantial limitations and 7 indicates executive parity or subordination. Source: AJR (2001)

Democracy in 1900: It ranges from 0 to 10 and the higher score indicated more democracy. Points from three dimensions; Competitiveness of Political Participation (from 1 to 3); Competitiveness of Executive Recruitment (from 1 to 2 and plus 1 point if there is an election); and Constraints on Chief Executive (from 1 to 4). Source: AJR (2001)

Rule of Law: "Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (Kaufmann et al. 2013). This measure ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance. Source: Worldwide Governance Indicators (WGI)

European settler mortality rate: Estimated European settlers' mortality rate.

Source: AJR (2001)

Log capped settler mortality: Settler mortality capped at 250 per 1,000 per annum (i.e., any mortality observation above 250 is set to equal 250. This is used to limit the high mortality outliers. Source: Acemoglu et al. (2012)

Population speaking English: Fraction of population speaking English. Source: Hall and Jones (1999)

Legal origin dummies: Legal origin of the company law or commercial code of each country. We use French legal dummy. Source: La Porta et al. (1999)

Colonial dummies: Dummy indicating whether country was a British, French, German, Spanish, Italian, Belgian, Dutch, or Portuguese colony. We use British and French colonial dummy. Source: La Porta et al. (1999).

Control of Corruption: "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests." This measure ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance. Source: Worldwide Governance Indicators (WGI)

Government Effectiveness: "perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies." This measure ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance. Source: Worldwide Governance Indicators (WGI)

Political stability and Absence of Voice/terrorism: "Perceptions of the likelihood of political instability and/or politicallymotivated violence, including terrorism." This measure ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance. Source: Worldwide Governance Indicators (WGI)

Regulatory Quality: "perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private

sector development." This measure ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance. Source: Worldwide Governance Indicators (WGI)

Voice and accountability: "perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media." This measure ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance. Source: Worldwide Governance Indicators (WGI)

Ten Items for Inglehart's Dimensions

See chapter 2 for details

Source: World Values Surveys Wave 3 (1995-1998), Wave4 (1999-2004), Wave 5 (2005-2009) and Wave 6 (2010-2014).

Importance of God :

Teach Children Obedience and Faith rather than Independence and Determination (Autonomy index) :

Disapproval of Abortion :

National Pride :

Respect for Authority :

Priority for Economic and Physical Security (Materialist Values) :

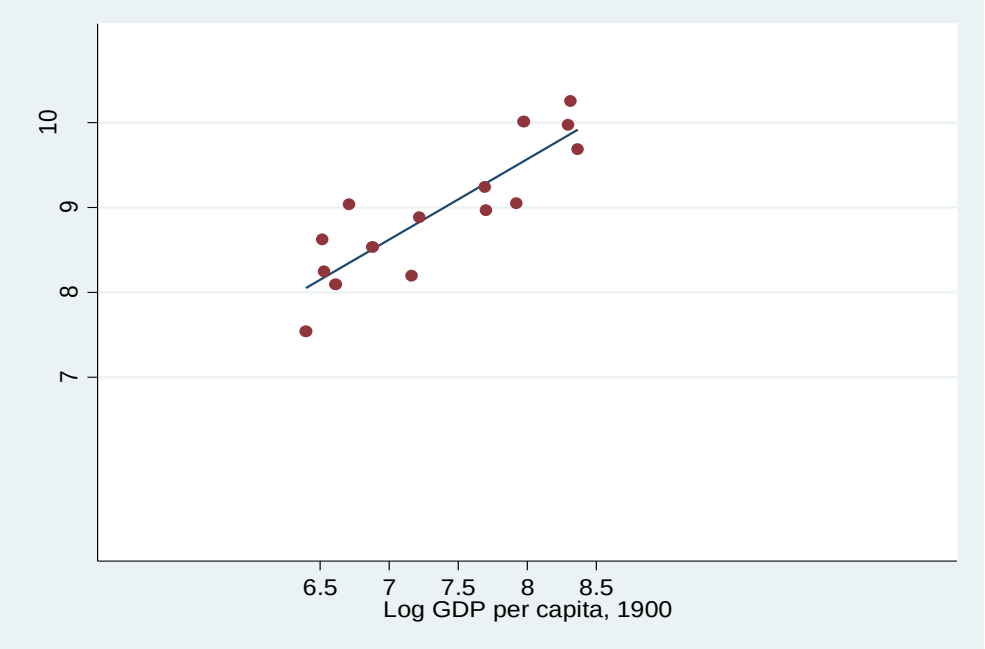
Feeling of Unhappiness:

Disapproval of Homosexuality :

Abstaining from Signing Petitions:

Distrusting in Other People:

Appendix 3.2 List of Additional Figures and Tables



Appendix-Figure 3. 1 The relationship between early economic performance and current economic performance (Ex-colonies)

Appendix-Table 3. 1 Value Fractionalization Index (3 value types)

High Fractionalization index		Low Fractionalization index	
Croatia	0.66	Jordan	0.06
Uruguay	0.66	Pakistan	0.07
Slovakia	0.66	Bangladesh	0.09
Spain	0.65	Indonesia	0.11
Finland	0.65	Tanzania	0.11
Albania	0.65	Egypt	0.11
Canada	0.65	Morocco	0.11

Notes: The number shows value fractionalization index in each country. Heterogeneous and homogeneous countries with respect to human values are shown in the table.

Appendix-Table 3. 2 Two-stage least squares: robustness checks for the full sample and for countries less affected by Europe (the full sample without Europe)

	Full sample				Full sample without Europe			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Two-Stage Least Squares: Dependent variable is log GDP per capita in 2010								
Rule of Law	1.29***	1.43***	1.65***	1.79***	1.38***	1.36***	1.68***	1.76***
	(0.18)	(0.33)	(0.27)	(0.45)	(0.25)	(0.32)	(0.33)	(0.42)
Latitude		-0.79		-0.68		0.18		-0.79
		(1.07)		(1.23)		(1.32)		(1.54)
British colonial dummy	-0.50**	-0.62**			-0.66**	-0.66**		
	(0.23)	(0.30)			(0.33)	(0.33)		
French colonial dummy	-0.49	-0.53			-0.597	-0.61		
	(0.37)	(0.40)			(0.43)	(0.44)		
French legal origin			0.50*	0.47			0.87**	0.90**
			(0.29)	(0.30)			(0.39)	(0.42)
Panel B: First Stage for Rule of Law								
value fractionalization	3.22***	2.27***	2.65***	1.97***	2.99***	2.57***	2.55***	2.16***
	(0.56)	(0.63)	(0.55)	(0.63)	(0.56)	(0.59)	(0.57)	(0.58)
Latitude		1.65***		1.27**		1.48***		1.56**
		(0.58)		(0.60)		(0.78)		(0.75)
British colonial dummy	0.45**	0.56**			0.58**	0.48**		
	(0.18)	(0.23)			(0.23)	(0.23)		
French colonial dummy	0.02	0.11			0.15	0.03		
	(0.35)	(0.34)			(0.32)	(0.32)		
French legal origin			-0.17	-0.08			-0.47**	-0.46**
			(0.21)	(0.21)			(0.21)	(0.21)
R-Squared	0.32	0.39	0.28	0.32	0.43	0.48	0.40	0.45
F statistics	32.95	13.11	23.00	9.82	28.02	18.93	20.35	13.83
Number of observations	79	79	84	84	48	48	51	51

Notes: Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; GDP per capita. Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of Law ranges between -2.5 (weak) to 2.5 (strong) governance performance; Value fractionalization ranges from 0 and 0.67 and is minimized when every individual in a society shares similar human values. Panel A reports the two stage-least squares estimates with log GDP per capita in 2010 as the dependent variable and Rule of Law is instrumented using value fractionalization. Panel B reports the corresponding first stage.

Appendix-Table 3. 3 Two-stage least squares using Average Rule of law between 2002 and 2010

	Full sample		Ex-colonies		Base sample		Base sample without Africa		Full sample without Europe	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Two-Stage Least Squares: Dependent variable is log GDP per capita in 2010										
Average Rule of Law	1.52***	1.67***	1.47***	1.58***	1.51***	1.72***	1.13***	1.27***	1.50***	1.55***
	(0.22)	(0.41)	(0.32)	(0.43)	(0.35)	(0.49)	(0.26)	(0.30)	(0.27)	(0.35)
Latitude		-0.66		-1.20		-2.14		-2.60**		-0.60
		(1.13)		(1.71)		(1.92)		(1.26)		(1.41)
Panel B: First Stage for Rule of Law										
value fractionalization	2.74***	1.99***	2.81***	2.32***	2.74***	2.20***	2.90***	2.54***	2.84***	2.41***
	(0.51)	(0.61)	(0.64)	(0.64)	(0.67)	(0.69)	(0.83)	(0.78)	(0.55)	(0.57)
Latitude		1.22**		1.92**		2.02**		2.31**		1.64**
		(0.58)		(0.81)		(0.84)		(0.96)		(0.76)
R-Squared	0.26	0.30	0.34	0.43	0.34	0.44	0.33	0.46	0.35	0.41
F statistics	28.83	10.54	19.41	13.25	16.75	10.94	12.19	10.67	26.34	18.01
Number of observations	84	84	40	40	35	35	27	27	51	51

Notes: Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable is log GDP per capita in 2010. Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Rule of Law ranges between -2.5 (weak) to 2.5 (strong) governance performance; Average Rule of Law is mean of Rule of Law from 2002 to 2010. Value fractionalization ranges from 0 and 0.67 and is minimized when every individual in a society shares similar human values. Panel A reports the two stage-least squares estimates with log GDP per capita in 2010 as the dependent variable and Rule of law is instrumented using value fractionalization. Panel B reports the corresponding first stage.

Appendix3.3 List of Countries Included in the Analysis

Sample of Countries Involved in this Chapter					
Base Sample	Algeria	Argentina	Australia	Bangladesh	Brazil
	Canada	Chile	Colombia	Dominican Rep.	Ecuador
	Ethiopia	Ghana	Guatemala	India	Indonesia
	Malaysia	Mali	Mexico	Morocco	New Zealand
	Nigeria	Pakistan	Peru	Singapore	Viet Nam
	South Africa	Trinidad and Tobag	Tunisia	Uganda	Egypt
	Tanzania	United States	Burkina Faso	Uruguay	Venezuela
Ex-colonies	Libya	Philippines	Rwanda	Zimbabwe	Zambia
Full Sample	Albania	Azerbaijan	Armenia	Bulgaria	Belarus
	China	Taiwan	Croatia	Cyprus	Estonia
	Finland	France	Georgia	Germany	Hungary
	Iraq	Israel	Italy	Japan	Kazakhstan
	Jordan	South Korea	Kyrgyzstan	Lebanon	Latvia
	Lithuania	Moldova	Netherlands	Norway	Poland
	Puerto Rico	Romania	Russia	Slovakia	Slovenia
	Spain	Sweden	Switzerland	Thailand	Turkey
	Ukraine	Macedonia	Great Britain	Yemen	

Notes: Base sample: 35 countries Ex-colonies: Base sample and 5 countries shown in the table. Full sample: all the 84 countries included in this table.

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Chapter Four: Culture and Economic Performance

Chapter Overview

This chapter investigates the role of culture (tolerance and respect for other) in economic outcomes using a panel dataset. We find that proportion of “value type”, fraction of individuals who share similar values, plays an important role in estimating the impact of culture on economic performance. One of the contributions of this chapter is that the use of value type as an instrument for culture instead of religion. As a result, this chapter succeeds to see the impact of respect on economic outcomes alleviating the concerns of the existence of non-religious countries. Our results are consistent with the research that shows the importance of respect in economic outcomes. Further, regardless of several treatments we employ we find the pattern obtained in the main results remains.

4.1 Introduction

There is a growing body of literature that shows that culture affects economic development (Breuer and McDermott, 2013; Gorodnichenko and Roland, 2011; Guiso et al., 2006; Knack and Keefer, 1997; Tabellini, 2010). Researchers has been attempted to see the causal relationship between many aspects of culture and economic outcomes. Culture is often measured by indicators of human values such as trust[50]. Tabellini (2010) argues that culture and institutions have impact on economic performance. In this chapter, we investigate the role of culture in economic development. The difficulty of investigating the role of culture in economic outcomes is economic outcomes also influences culture. Take trust as an example. Countries with high trust may be wealthier because trust affects economic outcomes. On the other hand, a more affluent country may promote more trust in the culture[51]. This chapter addresses this endogeneity problem using IV estimations. A large and growing body of literature has investigated the causal relationship between culture and economic performance using IV estimation. For instance, an article by Tabellini (2010) uses the literacy rate at the end of the 19th century and the past political institutions as instruments for culture in IV estimation. Further, many papers use some indicators of religion[52] as an instrument for culture. Guiso et al. (2006) use the individual's religion and country of ancestor's origin as instruments for trust. In Zak and Knack (2001), population shares of the Catholic, Muslim,

[50] Section 4.2.2 shows the relationship between culture and economic outcomes in various perspectives of culture

[51] Many researchers refer that economic development has a certain impact on culture in a country.

[52] Population share of Muslim is used in many papers to instrument culture. One of the difficulties in using religion is shown in the example of the Middle East. The main sects of the Islamic religion in this region are Sunni and Shi'a. However, the majority of the people in this region are classified as Muslims.

and Christian Orthodox are used as instruments for trust in their cross-country growth regression. Further, Knack (2002) uses religious composition as instruments for social capital. In summary, many papers use religion and historical variables as instruments for culture in their IV estimations.

Our identification strategy is similar to that of papers using religion as instrument for culture. However, instead of using religious affiliation, we use "value type" as one of the instruments for culture. Using world-wide survey data, this chapter classifies people into three groups (value types) and people who made similar responses are grouped together. Papers that use religion as instrument for culture assume that religion does not affect economic performance directly. In other words, proportion of people who share similar beliefs and thoughts has no direct impact on economic performance. We therefore assume that proportion of people who share similar values and beliefs (value type) has no direct impact on economic performance. Further, the probability of meeting with similar value type depends on the proportion of each value type. As culture (human values) seems to be affected by people who meet, it is natural to assume that proportion of value type affects culture[53]. Due to the above reasons, we assume that value type affects economic performance only through culture.

Value type is created using the following method. We first select 10 questions from WVS that are important dimensions of human values (Schwartz, 1999)[54]. Then, individuals who made similar responses in the 10 questions are classified into the same value type. Therefore, we recognize that people in the same value type shares similar values.

This chapter considers the impact of "Respect for others (respect)" that has been shown to promote economic development by many researchers.

[53] As seen in Appendix-Table 4.1, 89.74 percent of people in Jordan are classified as value type 1. Hence, it might be difficult for people in Jordan to be affected by value type 2 or value type 3. This leads to our assumption that the proportion of each value type affects culture.

[54] Ten questions used in this analysis are presented in section 2.4.2.2 Cultural framework by Schwartz

Tabellini (2010) argues that trust and respect for others foster economic development. Respect for others is considered to be important because it discourages cheating and it promotes the degree of trust in a society (Breuer and Mcdermott, 2013). Further, a positive impact of respect on economic outcomes is observed by them. In their IV estimations, respect is instrumented using "the proportions of the populations in 1980 that are identified as Catholic or Protestant" and "Civil liberties index in 1972". In substitution for religion this chapter uses value type. That is, we use "the proportions of the populations that are identified as one value type" and "Civil liberties index" as instruments for respect in our IV estimations. The results obtained in this chapter support that proportion of value type affects economic outcomes only through respect.

This chapter measures respect for others using the World Values Survey (WVS). Proportion of individuals selecting "Respect" in the following question is our measure of respect in a country.

Respect for others (Question wording) :

"Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five. (CODE FIVE ONLY)"

"Tolerance and respect for other people (a035)"

Our approach is similar to the way adopted by Breuer and Mcdermott (2013) but, we use value affiliations (types) instead of religious affiliations as an instrument for culture. This improves the robustness of the results in the literature.

Culture is often instrumented using historical variables (e.g. Tabellini, 2010) and religion (e.g. Guiso et al., 2006; Breuer and Mcdermott, 2013; Zak and Knack, 2001). As seen in Figure 3.5 (chapter 3), early economic performance tended to persist. Further, much of the literature shows that

culture affects economic development.

It is shown by researchers that culture cause economic development. Therefore, it is natural to assume that this causal relationship is also true in the past. Hence, historical variables may have an impact on past economic performance because historical variables have an impact on past economic performance through past culture[55]. Further, past economic performance tends to persist to the present. This implies that it is required to be careful when we use historical variables as instruments for current culture because it may lead to misleading conclusions.

There are several advantages to our approach compared with previous studies. First of all, this chapter is not using historical variables as instruments for culture so that we do not need to concern about the link mentioned above. Further, this chapter finds advantages of using our instrument instead of religion. Although many researchers use religion as instruments for culture, there are many people who are not so much affected by religion. Almost 100 percent of people in Egypt, Jordan, and Libya think that religion is important or rather important in their lives[56]. However, in Japan, only 21 percent of people think that religion is important or rather important. Further, in Sweden, only 27 percent of people agree with the importance of religion. As religion is important for some countries and not so important for other countries, it is beneficial to find different instruments in order to estimate the impact of culture in non-religious countries. In doing so, we can check the robustness of the results obtained by papers that assume religion affect economic performance only through culture. Secondly, it seems somewhat difficult to use religion because many people belong to more than one religion. The CIA World Fact Book shows that 83.9 percent of Japanese are classified as Shintoism and 71.4 percent

[55] Appendix-Figure 4.1 shows this relationship. It illustrates the link between early culture, early economic performance and current economic performance

[56] World Values Survey Wave 6 (2010-2014)

as Buddhism. According to Pew Research Reports, “As of 2010, there were 1.1 billion religiously unaffiliated people around the world, accounting for about one-in-six (16%) people worldwide. This makes the unaffiliated the third-largest religious grouping worldwide, behind Christians and Muslims, and about equal in size to the world's Catholic population”. Therefore, one of the merits of this paper is attained by the use of value type. The use of value type enables us to see the impact of culture on economic outcomes not only for religious countries but also for non-religious countries. In order to see the impact of culture on economic performance in non-religious countries, this chapter requires to find criteria for selecting religious and non-religious countries. We look at answers to the following question from WVS.

“A006 (Question Wording):

For each of the following aspects, indicate how important it is in your life. Would you say it is: Religion

1 Very important 2 Rather important 3 Not very important 4 Not at all important”

In our analysis, we identify whether a country is religious or not by proportion of individuals selecting “very important” or “rather important”. Countries where the proportion of people choosing “very important” or “rather important” is high (low) is classified as religious country (non-religious country).

In this chapter we first perform OLS and regress economic outcomes (output per worker and GDP per capita) on culture (respect for others). A strong positive relationship between respect for others and economic outcomes is found. Further, we add 10 variables from WVS, one at a time,

to see the impact of respect. One of the reasons why we include 10 variables[57] is that these variables can be a candidate for an omitted variable that is correlated with respect. In conclusion, we find that the impact of respect on economic outcomes remain significant in all cases. Then, respect is instrumented using proportion of the population identified as one value type and civil liberty index. A positive impact of respect on economic outcomes is observed in our IV regressions.

In a series of robustness checks, we include variables such as French legal origin (La porta et al., 1999) and ethnic fractionalization (Alesina et al., 2003). The main results are robust to the inclusion of these variables. Trust is commonly used by Economists to represent social capital and it has been argued that trust is fundamental determinant of economic outcomes. Therefore, this chapter includes it in our regressions accompanied with respect, latitude, French legal origin and ethnic fractionalization. Although the estimates changes by this treatment, inclusion of these variables has only little impact on our main results. Further our results are robust to changing criteria for the classification of religious country. The sources of data on economic outcomes are standard. We take Economic data from the Penn World Tables (version 7.0) and cultural values from WVS.

This chapter is organized as follows. Section 4.2 reviews the literature on culture and economic performance. Section 4.3 shows a discussion of our data. In section 4.4, we present our main results. Section 4.5 investigates the robustness of our results and section 4.6 provides concluding remarks.

[57] "Trust", "Independence", "Hardwork", "Feeling of Responsibility", "Imagination", "Thrift saving money and things", "Determination perseverance", "Religious faith", "Unselfishness", and "Obedience"

4.2 Literature Review

The literature linking culture to economic outcomes is growing. This section first considers definitions of culture. Then, we briefly show previous work done by non-economists and economists on culture and economic/political outcomes. Finally, we review the impact of several aspects of culture on economic outcomes.

Culture “denotes a historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and their attitudes toward life (Geertz, 1973).” In Guiso et al. (2006), culture is defined as “those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation.” Alesina and Giuliano (2015) point out that “Empirical papers, therefore, combine values and beliefs in the same definition.”

The causal relationship between culture and economic/political outcomes has been investigated by non-economists. In a case study of life in a rural village in Southern Italy, Banfield (1958) addresses a cultural explanation for poverty. He attributes the poverty to the excessive pursuit of narrow self-interest by its inhabitants. Further, Putnam (1993) provides evidence that the performance of local government in Italy is determined by social capital. Local governments functioned much better in places that have tradition and experienced free city states in the Middle Age. That is, culture affects the quality of political institutions.

As a measurement of culture, “Economists have measured culture in three different ways: by using survey data; by looking at second-generation immigrants to isolate the impact of culture, holding constant the economic and institutional environment; and by collecting experimental evidence

(Alesina and Giuliano, 2015).”

In this chapter, we measure culture using survey data. Further, we introduce some specific aspects of culture-trust, respect, responsibility, individualism and others.

It has been reported that trust positively affects economic development (Zak and Knack, 2001). As a measure of trust, many researchers use following question from World Values Survey.

“Trust (Question wording):

Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?:

1 Most people can be trusted, 2 need to be very careful.”

Trust is measured by the percentage of respondents say “most people can be trusted”. Therefore, it can be interpreted as generalized trust toward others. In Zak and Knack (2001), trust promotes investment and growth. Further, it is argued that trust enhances innovation because it reduces entrepreneurs’ monitoring cost (Knack and Keefer ,1997). Beugelsdijk et al. (2004) check robustness of the results in Zak and Knack (2001) and find that they are highly robust. It is concluded in the paper that social trust plays an important role in economic growth.

As discussed in Introduction, respect is recognized as one of the important factors to enhance economic development. Accompanied with respect, the impact of responsibility has been investigated. Responsibility is measured using the following question from WVS.

Responsibility (Question wording):

“Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five. (CODE FIVE ONLY)”

"Feeling of responsibility (a032)"

The proportion of individuals choosing a032 in the question is used to represent responsibility in a country. Breuer and Mcdermott (2013) show that respect and responsibility are critical to output. They also show that respect and responsibility reduce the impact of trust on output.

Using Hofstede's (2001) data, Gorodnichenko and Roland (2011) show that the individualism-collectivism dimension is the most important cultural variable that affects long-run growth. Further, a causal effect of individualism on economic outcomes is investigated in Gorodnichenko and Roland (2010). In order to see the impact of individualism, Individualism score is instrumented using frequency of blood types. As a result, they observe that individualist culture leads to innovation and rapid growth.

Tabellini (2010) and Williamson (2009) use combination of 4 variables-trust, respect, control, and obedience. This chapter sees the definition of obedience in section 4.4. Control is measure by the following question in the survey:

A173 How much freedom of choice and control (Question wording):

"Some people feel they have completely free choice and control over their lives, while other people feel that what we do has no real effect on what happens to them. Please use this scale (from 1 to 10) where 1 means 'none at all' and 10 means 'a great deal' to indicate how much freedom of choice and control in life you have over the way your life turns out."

Average value of the question is used to define control. The way to create culture is that they extracted their first principal component from the whole data set using above-mentioned four variables. Tabellini (2010)

shows that culture is positively correlated with trust, respect and control. On the other hand, it is negatively correlated with obedience. In the analysis, culture encourages economic development. Further, Williamson (2009) pointed out the importance of informal institutions using this index (culture).

4.3 Data and Descriptive Statistics

4.3.1 Value Type

In this section, we briefly discuss the measure of value type. World Values Survey (WVS) is used to construct value type and proportion of the population identified as one value type. The way of creating value type is similar to the way we have done in chapter 2 and chapter 3. In chapter 2, we adopt ten items that Inglehart and Baker (2000) and Inglehart and Welzel (2005) used. However, in this chapter, we use Schwartz 10 items. As mentioned in chapter 2, Schwartz (1994) proposed 10 basic human values. WVS adopts the following modified version.

1. It is important to this person to think up new ideas and be creative (Self-direction)
2. It is important to this person to be rich (Power)
3. It is important to this person living in secure surroundings (Security)
4. It is important to this person to have a good time (Hedonism)

5. It is important to this person to help the people nearby (Benevolence)

6. It is important to this person being very successful (Achievement)

7. It is important to this person adventure and taking risks (Stimulation)

8. It is important to this person to always behave properly (Conformity)

9. It is important to this person looking after the environment (Universalism)

10. It is important to this person tradition (Tradition)

Individuals rate the importance of each item on a 6-point scale labeled 1 (Very much like me), 2 (Like me), 3 (Somewhat like me), 4 (A little like me), 5 (Not like me), 6 (not at all like me). We use the fifth round and the sixth round of WVS data, which were collected in 2005–2014 because of availability of dataset: Wave 5 (2005-2009) and Wave 6 (2010-2014). We use all the countries available to construct value type but, we exclude some countries because some countries have no observations for our economic and cultural variables. The number of respondents varies across cultural groups and some cultural groups have 2 waves and others have only 1 wave. In contrast to ethnicity, language, and religion there are no pre-determined groupings for human values. By following Chapter 2, this chapter uses k-means cluster analysis in order to classify respondents into three groups. K-means cluster analysis makes it possible to group n observations (individuals) into k clusters in which each individual belongs to the cluster with the nearest response. By doing so, respondents in the same group (value type) share common characteristics and values. Cluster analysis tells us the population shares of the value types. Below is an explanation for each value

type.

Value type, Main countries and Main features of each value type

Value type 1:

Main Countries: Jordan, Pakistan and South Africa

Main Feature: People in this value type tend to disagree with 1 (self-direction) and 2 (power)

Value type 2:

Main Countries: Georgia, Brazil and Morocco

Main Feature: People in this value type tend to disagree with 7 (stimulation)

Value type 3:

Main Countries: Japan, Netherland and South Korea

Main Feature: People in this value type tend to disagree with 10 (Tradition)

Approximately 90 percent of individuals in Jordan are classified as value type 1 in wave 5. Further, 71 percent of people in South Africa are grouped into value type 1. Value type 1 mainly consists with people who don't agree with self-direction and power. More than half of people in Brazil and Georgia are classified as value type 2. One of the features of people in value type 2 is that they disagree with the importance of adventure compared with other value types. The respondents in Japan, Netherland and South Korea tend to have this value type. People classified as value type 3 have a tendency to disagree the importance of tradition. Appendix-Table 4.2.1 and Appendix-Table 4.2.2 show the distribution of the population of value types of the countries in wave 5 and 6. We use value type 1 because it is the largest group (popular value type) among three.

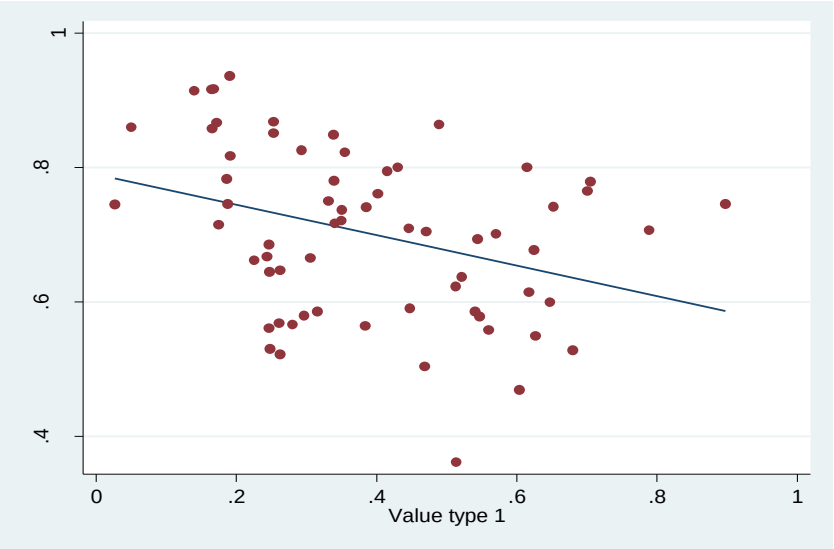


Figure 4. 1 Value type 1 and Respect (Full sample)

Notes: Value type 1 reflects the proportion of value type 1 in a country. The Vertical Axis respect; The Horizontal Axis Value type 1

Figure 4.1 shows the relationship between the proportion of people classified as value type 1 in a country and respect. A negative and a linear relationship is found in the figure (r = -0.35, p < 0.01)[58]. The next section examines this relationship. In Figure 4.2, we find the negative link between responsibility and the fraction of value type 1 (r = -0.60, p < 0.01). Finally, Figure 4.3 show the scatter plots of trust against proportion of value type 1. The scatter plots reveal a clear negative relationship (r = -0.51, p < 0.01).

[58] This will be our first stage for our main two stage least squares estimates.

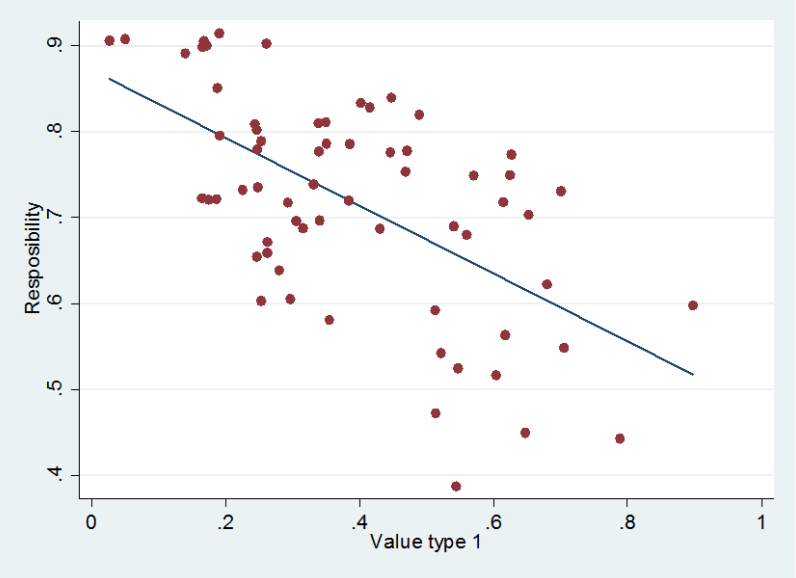


Figure 4. 2 Value type 1 and Responsibility (Full sample)

Notes: value type 1 reflects the proportion of value type 1 in a country The Vertical Axis responsibility; The Horizontal Axis Value type 1

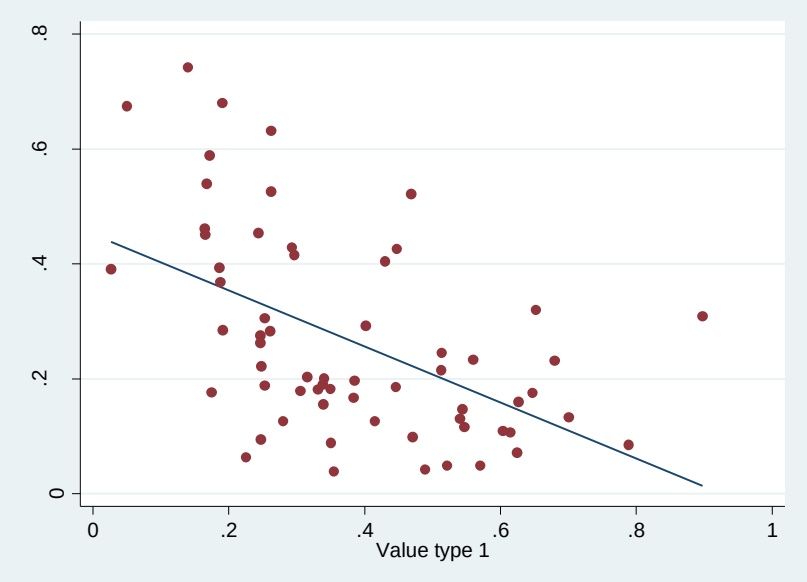


Figure 4. 3 Value type 1 and Trust (Full sample)

Notes: value type 1 reflects the proportion of value type 1 in a country. The Vertical Axis Trust; The Horizontal Axis Value type 1

4.3.2 Descriptive Statistics

Main datasets used in our empirical analysis are the Penn world table and the World Values Survey. As it has been reported that respect for others is an important in determinant of economic outcomes, we use respect for others as a measure of culture. As mentioned before, our cultural values such as respect and trust are measured using World Values Survey. We used Wave 5 and Wave 6 because Schwartz questions are not included in Wave 1 to Wave 4. Except data from WVS, this section follows Dearmon and Grier (2009) and takes each country/wave average as an observation. Our combined data yields observations for 65 countries that include developed and developing countries[59]. Table4.1 provides descriptive statistics for the key variables.

Table 4. 1 Data Summary for key Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Log output per worker	65	9.89	1.08	7.06	11.47
Log GDP per capita	65	9.07	1.16	6.32	10.83
Latitude	65	0.36	0.19	0.02	0.71
Respect	65	0.70	0.13	0.36	0.94
Trust	63	0.27	0.18	0.04	0.74
Value type 1	65	0.39	0.19	0.03	0.90

Before investigating the impact of respect in various countries, this section makes most of our identification strategy. Much of research use identification strategy that involves proportion of the individuals who are identified as Muslim, Catholic, or Protestant. However, this study uses fraction of the population classified as value type 1. Therefore, we can

[59] The list of countries in our sample is shown in Appendix 4.3.

comfortably see the impact of culture for countries where the proportion of a religious person in a country is low. To select non-religious countries from 65 observations, we use the following question from WVS.

"A006 (Question Wording):
For each of the following aspects, indicate how important it is in your life. Would you say it is: Religion
1 Very important 2 Rather important 3 Not very important 4 Not at all important"

This chapter focuses on the proportion of individuals selecting "1 Very important" or "2 Rather important" in this question. Hence, a006 ranges from 0 to 1 and the higher value indicates religious countries[60]. Appendix-Table 4.3 contains data summary for our key variable where a006 is less than 0.8[61]. It is observed that non-religious countries tend to be wealthier than religious countries. Appendix-table 4.5 show the list of countries with (1) a006<0.80, (2) 0.80≤a006<0.85, (3) 0.85≤a006<0.90, (4) 0.90≤a006<0.95, and (5) 0.95≤a006.

Figure 4.4 shows the relationship between value type 1 and respect for non-religious countries (countries with a006<0.8). We observe negative relationship between value type 1 and respect. In our full dataset, Sweden has highest respect with 0.94. The second highest is Switzerland with 0.92. On the other hand, Ethiopia is 0.36 and this is the lowest in our dataset. Restricting our attention to countries with a006<0.80, the lowest respect is Lebanon with 0.47. In the next section, we see a base estimation of the relationship between respect and economic outcomes using an ordinary least squares specification.

[60] In section 4.5.2, we use a040 (religious faith) from WVS instead of a006 to see the robustness of our results.
[61] Appendix-Table 4.2.1

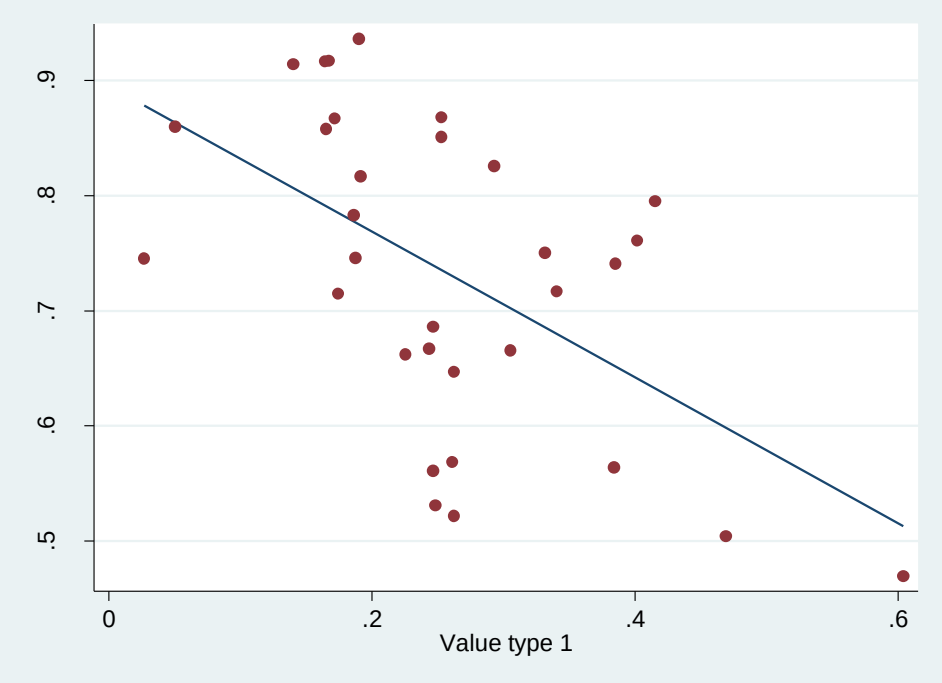


Figure 4. 4 Value type 1 and Respect for non-religious countries (countries a006<0.8)

Notes: value type 1 reflects the proportion of value type 1 in a country. A006<0.8 means that more than 20 percent of people in a country think that religion is not so important. There are 32 countries in the figure. The Vertical Axis respect; The Horizontal Axis value type 1

4.4 Results

4.4.1. Ordinary Least-Squares Regressions

We begin by examining the role of respect that has been studied in current literature. Further, latitude is included as an independent variable so that we are not going to estimate our model using country fixed effects. Our baseline specification is as follows

$$Y_{jk} = \alpha_0 + \alpha_1 C_{jk} + \alpha_2 X_j + \varepsilon_{jk}$$

Where Y_{jk} measures economic outcomes (e.g. log GDP per capita and log

output per worker) for country j in wave k. C_{jk} is a measure of culture and we are interested in α_1 because it captures the impact of culture on economic outcomes. X_j represents a control variable (if included) and we basically use latitude as a control variable. ε_{jk} is the error term. Now, we estimate this model using pooled OLS because our panel data is unbalanced[62] and inclusion of latitude makes it possible to grasp country-specific effects[63].

Table 4.2 shows the relationship between respect and economic outcomes for variety of samples. The results obtained using pooled OLS is shown in the table. The estimation is done for three different samples.

(i) Full sample: There are 65 countries.

(ii) a006<0.90: More than 10 percent of people in a country think that religion is not important. There are 39 countries.

(iii) a006<0.80: More than 20 percent of people in a country think that religion is not so important. There are 32 countries.

The regressions reveal the following results. Column (1) shows that in the full sample there is a strong relationship between respect and log output per worker. The R-square for the regression shows that over 40 percent of variation in output per worker is associated with variation in respect for others. Latitude is included as a regressor in even columns. In column (2), it is shown that the impact of respect remains significant. Inclusion of latitude changes the coefficient of respect a little (5.69 to 4.05). Columns (3)-(6) show that there is a strong correlation between respect and output per worker even after excluding countries where the proportion of a religious person in a country is relatively low. As seen in Columns (7)-(12), we find similar relationship using log GDP per capita as a dependent variable instead of log output per worker. There is a strong positive relationship between

[62] Some countries have data for only one wave while others have two waves.
[63] As latitude does not vary over time, it captures country-specific effects.

respect and log GDP per capita for full sample and for countries with low a006 (non-religious countries). As a whole, the results in table 4.2 show a strong tie between respect and economic outcomes.

Table 4. 2 OLS-Respect and Economic Outcomes

	Full sample		a006<0.90		a006<0.80		Full sample		a006<0.90		a006<0.80	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dependent variable is log ourput per worker						Dependent variable is log GDP per capita					
Respect	5.69***	4.05***	4.69***	3.61***	4.86***	3.35***	5.94***	4.19***	4.91***	3.80***	5.07***	3.59***
	(0.80)	(0.76)	(1.06)	(0.94)	(1.13)	(1.07)	(0.81)	(0.78)	(0.99)	(0.87)	(1.02)	(0.98)
Latitutde		2.77***		2.08***		2.49***		2.96***		2.13***		2.45**
		(0.54)		(0.56)		(0.89)		(0.57)		(0.57)		(0.89)
R-squared	0.43	0.63	0.43	0.59	0.46	0.60	0.41	0.61	0.44	0.60	0.48	0.61
Number of observations	65	65	39	39	32	32	65	65	39	39	32	32

Notes: robust Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Respect is from WVS. Columns (1)-(6) report OLS regression with log output per worker as the dependent variable; Source: Penn World Table. In columns (7)-(12), dependent variable is log GDP per capita; Source: Penn World Table. In columns (3), (4), (9) and (10), we used countries that less than 90 percent of people think that religion is important in their lives. In columns (5), (6), (11) and (12), we used countries that less than 80 percent of people insist the importance of religion. Source: a006, WVS. See Appendix 4.1 for more details.

In order to find whether there are variables for culture that plays important role in economic performance, we include candidates for omitted variables. We follow Breuer and Mcdermott (2013) and add one variable at a time. We use 10 variables that are created from the following questions from WVS:

"(Question Wording):

Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five. (CODE FIVE ONLY)

A029 Independence

A030 Hardwork

A032 Feeling of Responsibility

A034 Imagination

A038 Thrift saving money and things

A039 Determination perseverance

A040 Religious faith

A041 Unselfishness

A042 Obedience"

We use proportion of individuals selecting above mentioned questions. For instance, proportion of people choosing A042 is our variable "obedience" Further, we use trust question that is shown in section 4.2. The results are shown in table 4.3. It shows the impact of respect and added values. The first column shows the coefficient for the added cultural values. For instance, in the first row, we add independence in addition to latitude and respect. We find that independence has no significant effect on log output per worker, whereas latitude and respect are significant. As seen in the table, respect is highly significant and has positive sign in all cases. Even after controlling for variables for culture and latitude, we find a strong, robust link between respect for others and economic outcomes. Further, the same is observed when we use log GDP per capita as a dependent variable.

We also observe that responsibility plays an important role in economic outcomes and this is consistent with the results obtained in Breuer and Mcdermott (2013). Both respect and responsibility affect economic

outcomes. We also find negative association between obedience and economic outcomes. Moreover, we see that trust is insignificant when included with respect and latitude. By and large, the estimates are similar across all the specifications and we find that respect is positive and significant.

Table 4. 3 OLS The impact of respect and added values

	Dependent : log output per worker			Dependent : log GDP per capita		
Added	Added Value	Respect	Latitude	Added Value	Respect	Latitude
Independence	0.59	4.02***	2.61***	0.99**	4.13***	2.69***
	(0.47)	(0.79)	(0.53)	(0.48)	(0.81)	(0.54)
Hardwork	-1.00**	3.03***	2.74***	-0.97*	3.20***	2.94***
	(0.49)	(1.09)	(0.51)	(0.49)	(1.08)	(0.55)
Responsibility	2.16**	3.30***	2.29***	2.81***	3.21***	2.35***
	(0.87)	(0.84)	(0.51)	(0.85)	(0.89)	(0.53)
Imagination	0.18	4.03***	2.74***	0.96	4.07***	2.80***
	(0.89)	(0.80)	(0.56)	(0.96)	(0.85)	(0.57)
Thrift	-0.02	4.04***	2.77***	0.43	4.34***	2.93***
	(0.81)	(0.86)	(0.55)	(0.83)	(0.87)	(0.58)
Preseverance	0.59	4.01***	2.63***	1.34*	4.09***	2.65***
	(0.68)	(0.77)	(0.61)	(0.70)	(0.79)	(0.65)
Religious faith	-0.49	4.07***	2.39***	-1.17***	4.22***	2.06***
	(0.32)	(0.77)	(0.61)	(0.33)	(0.76)	(0.63)
Unselfishness	-0.35	4.14***	2.66***	-0.47	4.31***	2.82***
	(0.65)	(0.79)	(0.59)	(0.74)	(0.82)	(0.64)
Obedience	-1.71***	4.82***	1.53***	-2.38***	5.26***	1.24***
	(0.52)	(0.66)	(0.39)	(0.49)	(0.65)	(0.40)
Trust	-0.25	4.15***	2.87***	0.21	4.22***	2.85***
	(0.46)	(0.76)	(0.59)	(0.52)	(0.80)	(0.64)

Notes: robust Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable is log output per worker and log GDP per capita. Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Added values and Respect are from WVS. See Appendix 4.1 for more details.

It can be concluded from the OLS results that there is a strong positive relationship between respect for others and economic performance. A priori, it is possible to make causality discussion in both directions. Respect may affect economic outcomes positively. However, it may be the case that a wealthy country may promote more respect in the country. To tackle this problem, we use IV estimation. Tabellini (2010) uses IV estimation to estimate a causal effect of culture on economic outcomes. Further, there are many studies that estimate the impact of culture on economic outcomes by IV approach. The next section of the empirical analysis addresses concerns about endogeneity using IV estimation.

4.4.2. IV Results

In order to estimate the impact of culture on economic outcomes using IV approach, religion has been used as an instrument for culture in current literature. It is argued that religion affects economic outcomes only through culture. One explanation for this is that the purpose of religion is to shape people's values. It seems that proportion of cultural traits affect peoples' value. Human values are likely to be shaped by proportion of individuals who share similar thoughts. Therefore, we use value type as an instrument for culture (respect) instead of religion. Respect for others is instrumented using "the proportions of the populations in 1980 that are identified as Catholic or Protestant" and "Civil liberties index in 1972" in Breuer and Mcdermott (2013). We follow this strategy and use "the proportions of the populations that are identified as Value type 1" and "Civil liberties index in1990" as instruments for respect. Civil livery is used because the protection of civil liberties affects culture.

Table 4.4 reports models in which respect is treated as endogenous and

the proportion of value type 1 and civil liberty index are used as instruments for respect. Dependent variable is log output per worker.

We follow Staiger and Stock (1997) and find that F-statistics for the first stage regressions comfortably exceed 10 in all the columns. Therefore, weak instruments are not a problem. We also investigate the validity of our approach by using overidentification tests shown in the table. In all the models, the overidentification tests do not reject the null hypothesis so that this is one support for our exclusion restriction.

In columns (1) and (2) of the table, we observe significant positive effect of respect on output per worker. Latitude is included in even columns[64].
As seen in the table, inclusion of latitude does not change the relationship between respect and economic outcomes. Columns (3)-(10) document the impact of culture for countries where the proportion of a religious person in a country is relatively low. The estimates show a significant impact of respect on log GDP per worker. However, coefficients for respect in columns (1) and (2) are larger than other columns. We find that respect determines economic development in those countries too. In Column (1), the effect of respect on log output per worker is 10.67 and this is highly significant and larger than that of the OLS estimates (5.69). Panel B of the table shows that the coefficients for respect in the IV estimations are larger than that in the corresponding OLS regressions. As a result, value type and civil liberty can be used as instruments for culture (respect) not only for the full sample but also for non-religious countries. Because it is somewhat difficult to justify that religion forms culture in some specific countries, our result here improves the robustness of the results in papers such as Breuer and Mcdermott (2013) that discuss the importance of respect using religion as an instrument for culture. In the next section, we see robustness checks for our

[64] We follow Breuer and Mcdermott (2013) and AJR (2001) and included only latitude. As discussed in Mcdermott (2013), one of the reasons for using latitude is that latitude may be correlated with culture and lessens omitted variable bias.

main results.

Table 4. 4 IV results for various samples

	Full sample		a006<0.95		a006<0.90		a006<0.85		a006<0.80	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Two-Stage Least Squares: Dependent variable is log output per worker										
Respect	10.67***	8.57***	8.12***	6.92***	7.58***	6.20***	6.91***	5.70***	6.95***	5.80***
	(2.51)	(2.74)	(2.20)	(1.37)	(2.47)	(1.79)	(1.99)	(2.18)	(1.90)	(2.23)
Latitude		1.60		1.32**		1.38**		1.47		1.41
		(1.12)		(0.58)		(0.63)		(0.99)		(1.14)
Observations	65	65	46	46	39	39	34	34	32	32
First stage F-tests	17.32	10.40	17.41	14.61	12.04	12.09	15.38	12.03	13.63	11.45
Overidentification tests (p-value)	[0.36]	[0.65]	[0.93]	[0.78]	[0.58]	[0.31]	[0.17]	[0.14]	[0.21]	[0.22]
Panel B: Ordinary Least Squares										
Respect	5.69***	4.05***	5.55***	4.16***	4.69***	3.61***	5.05***	3.41***	4.86***	3.35***
	(0.80)	(0.76)	(0.96)	(0.87)	(1.06)	(0.94)	(1.06)	(1.06)	(1.13)	(1.07)
Latitude		2.77***		2.25***		2.08***		2.53***		2.49***
		(0.54)		(0.51)		(0.56)		(0.86)		(0.89)

Notes: robust Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable is log output per worker Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Respect is from WVS. Civil liberty is from Freedom House. Panel A reports the two stage-least squares estimates with log output per worker as the dependent variable and Respect is instrumented using value type 1 and civil liberty. Panel B reports the coefficient from an OLS regression with log output per worker as the dependent variable and respect in each column as independent variables. Overidentification tests (p-value) reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. See Appendix 4.1 for more details.

4.5 Robustness

4.5.1 Robustness Checks for Omitted Variables

Robustness of our approach relies on the assumption that the link between culture and economic outcomes is not driven by omitted variables. We are going to check whether the inclusion of variables affects our main results. Table 4.5 reports the effect of respect on economic outcomes when we control for a variety of additional variables.

Alesina and La Ferrara (2005) show that ethnic fragmentation affects economic outcomes negatively and Delhey and Newton (2005) document a negative relationship between ethnic diversity and trust. Therefore, we include ethnic fractionalization as an additional variable in our regressions. The use of ethnic fractionalization and legal origin[65] is fairly common in the literature.

Columns (1)-(6) of table 4.5 report two stage-least squares estimates with log output per worker as the dependent variable. Our instruments for respect are civil liberty and proportion of individuals classified as value type 1. F-statistics for the first stage regressions exceed 10 that is proposed by Staiger and Stock (1997). We also investigate the validity of our approach by using overidentification tests shown in the table. In all cases, the overidentification tests do not reject the null hypothesis so that this supports our exclusion restrictions.

In column (6), we include both French legal dummy and ethnic fractionalization. Many researcher report that ethnic fractionalization has negative impact on economic outcomes. This column finds a significant

[65] We use French legal origin. The omitted group is the others

negative effect of ethnic fractionalization on economic output per worker. In columns (7)-(12), dependent variable is log GDP per capita. Coefficient on ethnic fractionalization is negative and significant in (7), (8), (11) and (12). The table shows that inclusion of these variables does not affect our main results.

In summary, inclusion of legal origin dummy and ethnic fractionalization has small impact on the estimated coefficient on respect, but its significance level is not influenced by them. The impact of respect on economic outcomes is robust to inclusion of these variables.

Table 4. 5 Effect of respect on economic outcomes after using extended controls

	Full sample											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dependent variable is log ourput per worker						Dependent variable is log GDP per capita					
Respect	9.06***	8.20***	10.19***	8.54***	8.78***	8.14***	10.03***	9.33***	10.98***	9.73***	9.55***	9.24***
	(2.51)	(2.29)	(2.88)	(3.01)	(1.90)	(1.63)	(3.53)	(3.46)	(3.58)	(2.91)	(3.01)	(2.84)
Latitutde		0.99		1.49		0.89		0.73		1.18		0.39
		(0.76)		(0.97)		(0.84)		(1.18)		(1.08)		(1.40)
Ethnic fractionalization	-1.20**	-0.86**			-1.17***	-0.88*	-1.31*	-1.07*			-1.25**	-1.13**
	(0.56)	(0.42)			(0.43)	(0.53)	(0.67)	(0.55)			(0.57)	(0.53)
French legal origin			-0.30	-0.11	-0.19	-0.10			-0.467*	-0.34	-0.36	-0.32
			(0.25)	(0.25)	(0.22)	(0.26)			(0.27)	(0.28)	(0.28)	(0.23)
Observations	64	64	65	65	64	64	64	64	65	65	64	64
First stage F-tests	16.20	11.14	17.08	10.67	15.92	11.40	16.20	11.14	16.79	10.67	15.92	11.40
Overidentification tests (p-value)	[0.79]	[0.94]	[0.46]	[0.69]	[0.97]	[0.97]	[0.18]	[0.20]	[0.15]	[0.19]	[0.26]	[0.26]
Number of observations	65	65	39	39	32	32	65	65	39	39	32	32
R-squared	0.43	0.63	0.43	0.59	0.46	0.60	0.41	0.61	0.44	0.60	0.48	0.61
R-squared	65	65	39	39	32	32	65	65	39	39	32	32
Number of observations	0.43	0.63	0.43	0.59	0.46	0.60	0.41	0.61	0.44	0.60	0.48	0.61

Notes: robust Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable in (1)-(6) is log output per worker; Dependent variable in (7)-(12) is log GDP per capita Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Ethnic fractionalization ranges from 0 to 1. Source: Alesina et al. (2003); Respect is from WVS. Civil liberty is from Freedom House. Respect is instrumented using value type 1 and Civil liberty. Overidentification tests (p-value) reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. See Appendix 4.1 for more details.

In table 4.6, trust, ethnic fractionalization and legal origin dummy are included in our estimations. All specifications include latitude. Columns (1) and (2) report two stage-least squares estimates with log output per worker as the dependent variable. In columns (3) and (4), dependent variable is log GDP per capita. We find that respect has positive effect on both output per worker and GDP per capita.

As seen in the table, trust is insignificant for all columns. This implies that respect reduces the impact of trust. When we endogenize respect in columns 2 and 4 and instrument for it using civil liberty index and value type, we also find that the effect of trust is not significant. Further, the coefficient on respect is larger than that of OLS estimate. Overall, inclusion of French legal origin, ethnic fractionalization and trust has small effect on our main results and respect remains to be positive and significant.

Table 4. 6 Effect of respect on economic outcomes after using extended controls

	Full sample			
	(1)	(2)	(3)	(4)
	log ourput per worker		log GDP per capita	
	OLS	IV	OLS	IV
Respect	4.31***	8.06***	4.56***	9.08***
	(0.74)	(2.98)	(0.72)	(3.45)
Latitutde	2.17***	1.15	1.81**	0.59
	(0.71)	(1.14)	(0.71)	(1.34)
Ethnic fractionalization	-0.86*	-0.91	-1.01**	-1.07*
	(0.49)	(0.58)	(0.50)	(0.63)
French legal origin	-0.089	-0.20	-0.26	-0.40
	(0.20)	(0.27)	(0.21)	(0.24)
Trust	-0.41	-0.72	-0.022	-0.39
	(0.51)	(1.22)	(0.55)	(1.24)
Observations	62	62	62	62
R-Squared	0.66		0.66	
First stage F-tests		11.64		11.64
Overidentification tests (p-value)		[0.64]		[0.18]

Notes: robust Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable in (1) and (2) is log output per worker; Dependent variable in columns (3) and (4) is log GDP per capita Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Ethnic fractionalization ranges from 0 to 1. Source: Alesina et al. (2003); Respect is from WVS. Civil liberty is from Freedom House. Respect is instrumented using value type 1 and Civil liberty. Overidentification tests (p-value) reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. See Appendix 4.1 for more details.

4.5.2 Religious Faith

In this study, we exploit value type instead of religion because there are several advantages. One of them is that it enables us to check robustness of the impact of culture on economic outcomes for countries where the proportion of a religious person in a country is relatively low. Main results show that respect has positive impact on economic outcomes not only for full sample but also for non-religious countries. This section checks the robustness of this result. Section 4.3 classifies countries using proportion of respondents who answer that religion is important in question a006 “Important in life: Religion” from WVS.

This section, instead, uses a040 “Religious faith” (see section 4.4) to classify countries into two groups-religious country and non-religious country. We select countries using proportion of individuals selecting “religious faith”. As our strategy enables us to estimate the impact of culture on economic performance in non-religious countries, this section focuses on countries with low religious faith (a40). In table 4.5.2, we perform IV estimation for three different samples. Although F-statistic is small in some columns, we observe the positive impact of respect on economic outcomes for countries where religious faith is not recognized as important quality for children to learn at home.

The set of results from table 4.7 finds a positive impact of respect on economic outcomes and the results presented here support our main findings.

Table 4. 7 IV-Religious faith

	Full sample		a040<0.40		a006<0.35	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Two-Stage Least Squares: Dependent variable is log GDP per worker						
Respect	10.67***	8.57***	7.07***	5.23***	5.23***	4.70**
	(2.51)	(2.74)	(2.43)	(1.75)	(1.97)	(2.05)
Latitude		1.60		1.94*		0.79
		(1.12)		(1.12)		(1.00)
Observations	65	65	31	31	28	28
First stage F-tests	17.32	10.40	9.57	8.18	14.23	9.95
Overidentification tests (p-value)	[0.36]	[0.65]	[0.49]	[0.47]	[0.12]	[0.13]

Notes: robust Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable is log output per worker Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Respect is from WVS. Civil liberty is from Freedom House. This table reports the two stage-least squares estimates with log output per worker as a dependent variable and Respect is instrumented using value type 1 and Civil liberty. Overidentification tests (p-value) reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. In columns (3) and (4), we used countries where less than 40 percent of people selecting religious faith in a040. In columns (5) and (6), we used countries where less than 35 percent of people consider religious faith to be especially important. Source: WVS. See Appendix 4.1 for more details.

4.5.3 Robustness to the Elimination of Regions

This section investigates whether our results are obtained by some particular region of the world. This is common strategy in empirical studies. This section drops one geographical region at a time from the regression sample. Further, we use samples that have more than 45 observations.

Therefore, the world regions that we consider for one-at-a-time elimination from the full estimation sample include SubSaharan Africa (SSA), East Asia and Pacific (EAP), Latin America and the Caribbean (LAC), North America, and South Asia. The Appendix-Table 4.6 reveals that the key findings from our analysis are robust to dropping the above-mentioned regions one at a time.

4.6 Concluding Remarks for Chapter 4

This section is motivated by interesting studies that assert impact of culture on economic performance. Recent papers document that "tolerance and respect for other people (respect)" plays an important role in economic outcomes. It is has been pointed out by many researchers that causality between culture and economic outcomes can be in both directions. This leads to the use of IV estimation. In order to instrument culture, historical variables and religion are widely used. We follow this strategy but, we use the proportion of the population classified as value type 1 instead of the proportion of the population with religious faith identified as Catholic or Protestant. There are several merits of using value type as an instrument for respect. One of them is that there are many countries where people living there are not very religious. The use of religion as one of the instruments implicitly assumes that religion affects beliefs and culture. Therefore, our strategy enables us to check the robustness of previous studies. Our main results show that respect for others positively affects economic outcomes. Further, the concern of the existence of non- religious country is untangled. In addition to the above-

mentioned merits, our instruments do not include historical variable.

Historical variables may have an impact on past economic performance through past culture. Further, as stated in chapter 3, past economic performance tend to persist to the present. Therefore, the strategy of using historical variables as instruments for current culture is somewhat unconvincing. As this chapter does not use historical variables and religion, it makes

The results obtained here are consistent with the result of current literature. We see the positive impact of respect on economic outcomes not only for full sample but also for non-religious countries. Further, inclusion of candidates for omitted variables such as “Trust”, “Independence”, “Hard work”, “Feeling of Responsibility”, “Imagination”, “Thrift saving money and things”, “Determination perseverance”, “Religious faith”, “Unselfishness”, and “Obedience” has only little impact on our main result. This chapter further reports that the results are robust to inclusion of variables such as legal origin, ethnic fractionalization, and trust. Again, we find robust effect of respect for others on economic performance.

Appendix

Appendix 4.1 Data and Cultural Values

Data Description and Sources

GDP per capita: Source: Penn World Table 7.0

Output per worker: Source: Penn World Table 7.0

Latitude: Absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999)

A006 (Important in life: Religion): Proportion of individuals selecting religion is " 1 Very important" or " 2 Rather important" in Question a006 Source: the WVS

A040 (Religious Faith): Proportion of individuals selecting religion is "Religious Faith" in Question a040 Source: the WVS

Trust: Proportion of individuals selecting "most people can be trusted" in Question a165 Source: the WVS

Responsibility: Proportion of individuals selecting "Resposibility" in Question a032 Source: the WVS. See Appendix 4.1 for details

Respect: Proportion of individuals selecting "Respect" in Question a035. Source: the WVS. See Appendix 4.1 for details

Other cultural values (a029: independence, a030: hard work, a034: imagination, a038: thrift, a039: perseverance, a040: religious faith, a041: unselfishness, a042: obedience): Proportion of individuals selecting each quality. Source: the WVS.

Civil Liberty: Index of Civil Liberties in 1990. Because of missing values, we used Civil liberties in 1991 for some countries such as Russia. It ranges from 1 to 7 and we reversed this scale so that larger numbers indicate a higher degree of freedom .Source: Freedom House

Legal origin dummies: Legal origin of the company law or commercial code of each country. We use French legal dummy. Source: La Porta et al. (1999)

Ethnic Fractionalization: Ethnic fractionalization index of each country

constructed by Alesina et al. (2003). It captures the probability that two individuals, selected at random from a country's population, will belong to different ethnic groups. Source: Alesina et al. (2003)

Ten Items for Schwartz's Dimensions

Source: World Values Surveys; Wave 5 (2005-2009) and Wave 6 (2010-2014).

Question wording: Now I will briefly describe some people. Using this card, would you please indicate for each description whether that person is very much like you, like you, somewhat like you, not like you, or not at all like you? (Code one answer for each description):

A189 (Schwartz: It is important to this person to think up new ideas and be creative**)**

It is important to this person to think up new ideas and be creative; to do things one's own way.

A190 (Schwartz: It is important to this person to be rich)

It is important to this person to be rich; to have a lot of money and expensive things.

A191 (Schwartz: It is important to this person living in secure surroundings)

Living in secure surroundings is important to this person; to avoid anything that might be dangerous.

A192 (Schwartz: It is important to this person to have a good time)

It is important to this person to have a good time; to "spoil" oneself.

A193 (Schwartz: It is important to this person to help the people nearby)

It is important to this person to help the people nearby; to care for their

well-being.

A194 (Schwartz: It is important to this person being very successful)

Being very successful is important to this person; to have people recognize one's achievements.

A195 (Schwartz: It is important to this person adventure and taking risks)

Adventure and taking risks are important to this person; to have an exciting life.

A196 (Schwartz: It is important to this person to always behave properly)

It is important to this person to always behave properly; to avoid doing anything people would say is wrong.

A197 (Schwartz: It is important to this person looking after the environment)

Looking after the environment is important to this person; to care for nature.

A198 (Schwartz: It is important to this person tradition)

Tradition is important to this person; to follow the customs handed down by one's religion or family.

Respondents answer the above questions from the following

1 Very much like me

2 Like me

3 Somewhat like me

4 A little like me

5 Not like me

6 Not at all like me

Cultural Values- Ten Values used in the Analysis

Question wording: Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five. (CODE FIVE ONLY)

A029 Independence
A030 Hard work
A032 Feeling of Responsibility
A034 Imagination
A035 Respect for others
A038 Thrift saving money and things
A039 Determination perseverance
A040 Religious faith
A041 Unselfishness
A042 Obedience

A 165 (Trust) Question wording:
"Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?
1 Most people can be trusted, 2 need to be very careful.

Appendix 4.2

Appendix-Table 4. 1 (wave 5) (Schwartz) Distribution of the population of the countries in wave 3 among value types, %

Country	Value type 1	Value type 2	Value type 3
Argentina	17.45	43.84	38.71
Australia	16.43	32.43	51.14
Brazil	24.74	58.21	17.04
Bulgaria	24.80	39.61	35.59
Burkina Faso	54.38	28.77	16.86
Canada	29.30	37.82	32.89
Chile	41.52	32.61	25.87
China	26.25	43.49	30.26
Cyprus	47.09	34.01	18.90
Egypt	44.61	48.87	6.52
Ethiopia	51.36	11.53	37.11
Finland	17.17	35.76	47.07
France	25.28	31.79	42.93
Georgia	34.99	58.90	6.11
Germany	18.75	28.53	52.72
Ghana	78.91	15.02	6.08
Great Britain	25.30	40.04	34.66
Hungary	40.16	36.71	23.12
India	56.01	20.02	23.97
Indonesia	44.74	38.24	17.02
Japan	2.69	13.10	84.21
Jordan	89.74	6.43	3.83
Malaysia	35.09	23.98	40.94
Mali	64.75	27.32	7.92
Mexico	33.91	40.12	25.97
Moldova	30.54	38.73	30.74
Morocco	54.07	27.13	18.80
Netherlands	16.54	18.58	64.88
Norway	14.02	34.35	51.63
Peru	22.58	39.16	38.27
Poland	33.81	46.08	20.10
Romania	31.51	40.62	27.87
Russia	24.62	37.63	37.75
Rwanda	52.14	28.79	19.07
Slovenia	33.13	40.06	26.81
South Africa	70.50	17.30	12.20

South Korea	26.11	13.51	60.38
Spain	34.06	35.63	30.31
Sweden	19.00	29.98	51.02
Switzerland	16.74	31.66	51.61
Thailand	29.65	17.42	52.93
Trinidad and Tobago	35.51	44.69	19.80
Turkey	57.05	28.84	14.11
Ukraine	24.65	37.62	37.74
United States	18.63	32.43	48.94
Uruguay	19.14	38.91	41.95
Viet Nam	46.88	28.20	24.92
Zambia	54.71	18.24	27.06
Country	Value type 1	Value type 2	Value type 3

Notes: People in value type 1 tend to disagree with 1 (self-direction) and 2 (power); Individuals in value type 2 tend to disagree with 7 (stimulation); People in value type 3 tend to disagree with 10 (Tradition)

Appendix-Table 4. 2 (wave 6) (Schwartz) Distribution of the population of the countries in wave 3 among value types, %

Country	Value type 1	Value type 2	Value type 3
Algeria	61.70	20.79	17.50
China	26.25	28.83	44.91
Colombia	48.92	39.38	11.69
Ecuador	62.47	17.76	19.77
Egypt	51.28	33.29	15.43
Germany	24.35	23.74	51.91
Iraq	65.22	22.39	12.39
Jordan	70.08	21.27	8.64
Lebanon	60.37	12.35	27.28
Libya	61.45	29.11	9.45
Morocco	28.03	46.50	25.48
Netherlands	5.02	20.72	74.26
Pakistan	68.00	5.61	26.38
Rwanda	38.38	12.64	48.98
Spain	38.51	32.11	29.39
Tunisia	62.67	24.38	12.96
Yemen	43.08	42.95	13.98

Notes: People in value type 1 tend to disagree with 1 (self-direction) and

2 (power); Individuals in value type 2 tend to disagree with 7 (stimulation); People in value type 3 tend to disagree with 10 (Tradition)

Appendix-Table 4. 3 Data Summary for key variables when a<0.80

Variable	Obs	Mean	Std. Dev.	Min	Max
Log output per worker	32	10.42	0.97	7.64	11.47
Log GDP per capita	32	9.72	0.98	6.93	10.83
Latitude	32	0.47	0.16	0.02	0.71
Respect	32	0.73	0.13	0.47	0.94
Trust	32	0.35	0.19	0.06	0.74
Value type 1	32	0.26	0.12	0.03	0.60

Notes: Log output per worker and Log GDP per capita Source: Penn World Table; Latitude Source La porta et al. (1999); Respect and Trust Source: WVS; Value type 1 Proportion of people classified as value type 1. People in value type 1 inclined to disagree with 1 (self-direction) and 2 (power)

Appendix-Table 4. 4 IV results for various samples-dependent variable is log GDP per capita

	Full sample		a006<0.95		a006<0.90		a006<0.85		a006<0.80	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Two-Stage Least Squares: Dependent variable is log GDP per capita										
Respect	11.67***	9.80***	8.45***	7.31**	7.78**	6.46**	7.12***	5.95**	7.08**	5.99**
	(3.36)	(3.54)	(2.57)	(2.93)	(3.10)	(3.09)	(2.48)	(2.41)	(3.10)	(2.51)
Latitude		1.48		1.27		1.41		1.47		1.39
		(0.93)		(0.88)		(0.97)		(0.99)		(1.25)
Observations	65	65	46	46	39	39	34	34	32	32
First stage F-tests	16.70	10.37	13.59	12.25	9.30	10.12	11.69	9.75	10.40	9.27
Overidentification tests (p-value)	[0.12]	[0.17]	[0.82]	[0.84]	[0.66]	[0.45]	[0.28]	[0.26]	[0.28]	[0.29]
Panel B: Ordinary Least Squares										
Respect	5.94***	4.19***	5.72***	4.30***	4.91***	3.80***	5.31***	3.68***	5.07***	3.59***
	(0.81)	(0.78)	(0.92)	(0.83)	(0.99)	(0.87)	(0.98)	(0.98)	(1.02)	(0.98)
Latitude		2.96***		2.28***		2.13***		2.52***		2.45**
		(0.57)		(0.53)		(0.57)		(0.85)		(0.89)

Notes: robust Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable is log output per worker Source: Penn World Table; Latitude is absolute value of the latitude of the country (distance from the equator). It ranges from 0 and 1 and 0 is the equator. Source: CIA Fact Book and La Porta et al. (1999); Respect is from WVS. Civil liberty is from Freedom House. Panel A reports the two stage-least squares estimates with log output per capita as the dependent variable and Respect is instrumented using value type 1 and Civil liberty. Panel B reports the coefficient from an OLS regression with log output per worker as the dependent variable and Respect

in each column as independent variables. Overidentification tests (p-value) reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. See Appendix 4.1 for more details. See Appendix 4.1 for more details.

Appendix-Table 4. 5 Sample of Countries

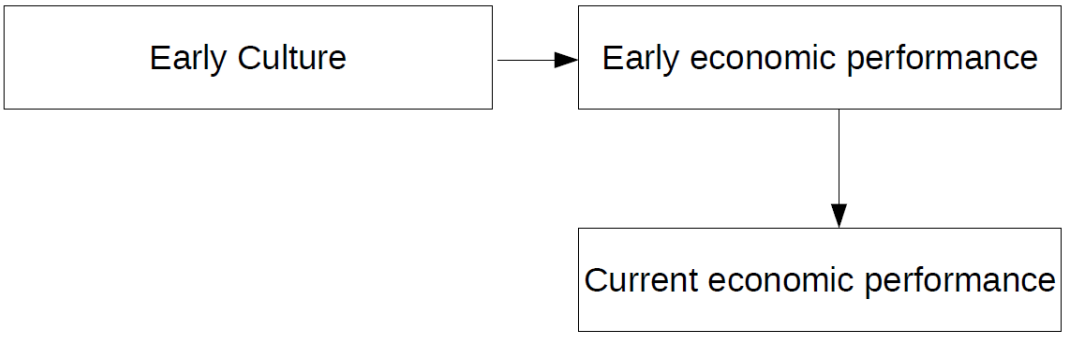
a006<0.80	Argentina	Australia	Bulgaria	Canada	Chile
	China (5)	China (6)	Finland	France	Germany
	Germany	Great Britain	Hungary	Japan	Lebanon
	Moldova	Netherlands (5)	Netherlands (6)	Norway	Peru
	Russia	Rwanda	Slovenia	South Korea	Spain (5)
	Spain (6)	Sweden	Switzerland	Ukraine	United States
	Uruguay	Viet Nam			
0.80≤a006<0.85	Cyprus	India			
0.85≤a006<0.90	Colombia	Ecuador	Mexico	Poland	Trinidad and Tobago
0.90≤a006<0.95	Brazil	Ethiopia	Romania	South Africa	Thailand
	Turkey	Zambia			
0.95≤a006	Algeria	Burkina Faso	Egypt (5)	Egypt (6)	Georgia
	Ghana	Indonesia	Iraq	Jordan (5)	Jordan (6)
	Libya	Malaysia	Mali	Morocco (6)	Morocco (6)
	Pakistan	Rwanda	Tunisia	Yemen	

Notes: Waves are written in parentheses for countries that have 2 observations. a006 shows the proportion of individuals selecting religion is important or rather important in a country. Therefore, we call countries with low a006 as non-religious countries.

Appendix-Table 4. 6 IV results- dropping one geographical region at a time from the regression sample

	(1)	(2)	(3)	(4)	(5)
Panel A: Two-Stage Least Squares: Dependent variable is log output per worker					
Respect	10.91***	8.15***	11.15***	10.53***	10.51***
	(3.32)	(2.7)	(3.99)	(3.21)	(3.07)
Observations	56	57	56	63	63
First stage F-tests	15.59	9.99	12.37	15.79	18.28
Overidentification tests (p-value)	[0.43]	[0.80]	[0.94]	[0.37]	[0.24]
Omitted Region	LAC	SSA	EAP	North America	South Asia

Notes: LAC: Latin America and the Caribbean; SSA:SubSaharan Africa; EAP:East Asia and Pacific. Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01; Dependent variable is log output per worker Source: Penn World Table; Respect is from WVS. Civil liberty is from Freedom House. This table reports the two stage-least squares estimates with log output per worker as a dependent variable and Respect is instrumented using value type 1 and Civil liberty. Overidentification tests (p-value) reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. In column (1), LAC is excluded from our sample. In column (2), SSA is excluded. EAP is eliminated from the sample in column (3). In column(4), North America is excluded and South Asia is eliminated in column (5). See Appendix 4.1 for more details.



Appendix-Figure 4. 1 Early culture, early economic performance and current economic performance

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Concluding Remarks

This thesis set out to investigate the role of cultural diversity based on human values (value diversity). Value diversity measure is different from prevailing measures of cultural diversity in the sense that it captures heterogeneity in internal traits. This study found several merits of introducing our measure. We also focused on the proportion of the people who share similar values (value type). We constructed value type and value diversity (value fractionalization and value polarization) and casted light on the use of them by the study of the role of formal and informal institutions.

Chapter 1 discussed motivation and background behind the thesis. Contributions to the current literature were also outlined in this chapter. Chapter 2 argued the weaknesses of commonly used measure of cultural diversity and we proposed value diversity measures using data from the World Values Survey. We first discussed the advantage and disadvantage of cultural diversity and using interesting examples to demonstrate that value diversity measure captures perspectives that is different from prevailing cultural diversity measures. In next two chapters the usefulness of our indices for questions of economic development is demonstrated.

The third and fourth chapters investigated correspondingly the impact of formal and informal institutions on economic performance using the indices constructed in Chapter 2. Chapter 3 revisited the existing theory by Acemoglu et al. (2001) and sought alternative ways of estimating the impact of formal institutions (Rule of law) on economic performance. Instead of using historical variables as an instrument for institutions, we exploited value fractionalization as an instrument to disentangle the impact of current institutions on economic performance. The use of value fractionalization made it possible to mitigate some concerns in previous studies such as poor

quality of historical dataset and the link that historical variables may affect current economic performance not only through institutional development but also through past economic performance. In addition to several new findings, the results showed that the quality of institution plays an important role in economic development.

Chapter 4 on the other hand focused on the role of informal institutions (respect for others) in economic outcomes. This thesis adopted fraction of individuals who share similar values as instruments for respect in the IV estimation. Recent papers use religion as one of the instruments for culture. This is because the purpose of religion is to shape people's values. However, the assumption that religion affects culture is somewhat unconvincing for non-religious countries. Therefore, our approach enabled us to see the impact of respect on economic outcomes alleviating the concerns of the existence of non-religious countries. This chapter extended our knowledge of the impact of respect for others without using commonly used instruments- historical variables and religion.

One of the limitations with our study is that our data heavily depends on WVS. Future research might examine whether these results can be replicated using data other than from WVS. Although a large battery of checks has been done to provide evidence of causal relationship between institutions and economic performance, it is difficult to rule out omitted factors completely. Further, the study would have been more interesting if it had included more countries. Especially, Schwartz items are not included in wave 1 to wave 4 of WVS so that we have only 65 observations in chapter 4.

Despite these limitations, this thesis is the first to construct diversity measures based on human values that lead to interesting results regarding economic development.